DEC 3 1926

BROOKLYN BOTANIC GARDEN RECORD

VOL. XIV JANUARY, 1925 No. 1

EDITED BY

C. STUART GAGER

CONTENTS

PAGE

List of Seeds Collected During the Year 1924 and Offered in Exchange 1

PUBLISHED QUARTERLY

AT LANCASTER, PA.

BY THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES

Entered as second-class matter in the Post-office at Lancaster, Pa., under Act of August 24, 1912.

BROOKLYN BOTANIC GARDEN

Scientific, Educational, and Administrative Officers

SCIENTIFIC AND EDUCATIONAL

The Staff *

C. STUART GAGER, Ph.D., Sc.D., Pd.D., *Director*
MONTAGUE FREE, *Horticulturist*
ARTHUR HARMOUNT GRAVES, Ph.D., *Curator of Public Instruction*
ALFRED GUNDERSEN, Docteur de l'Université (Paris), *Curator of Plants*
ELSIE TWEMLOW HAMMOND, M.A., *Assistant Curator of Elementary Instruction*
GEORGE M. REED, Ph.D., *Curator of Plant Pathology*
ELLEN EDDY SHAW, B.S., *Curator of Elementary Instruction*
RAY SIMPSON, *Librarian*
NORMAN TAYLOR, *Curator of Plants and Plantations*
ORLAND E. WHITE, Sc.D., *Curator of Plant Breeding and Economic Plants*

Other Officers

MARY AVERILL, *Honorary Curator of Japanese Gardening and Floral Art*
HAROLD A. CAPARN, *Consulting Landscape Architect*

RALPH CURTISS BENEDICT, Ph.D., *Resident Investigator*

MAUDE L. HICKOK, *Instructor*
LAURA ALMA KOLK, M.A., *Research Assistant*
DOROTHY I. NEFF, A.B., *Research Assistant*
MABEL E. TURNER, B.S., *Instructor*

EDITH R. DALY, *Library Assistant*
BERTHA EBELING, *Curatorial Assistant*
HELEN SMITH HILL, *Curatorial Assistant*
LOIS DAVIS VAN GORDEN, *Curatorial Assistant*
CHARLOTTE S. YOUNG, A.B., *Curatorial Assistant*

ADMINISTRATIVE

———— *Secretary and Accountant*
MAUDE E. VORIS, *Assistant Secretary*
MARION S. GIBBS, *Business Office Assistant*

ANN C. OHLANDER, *Secretary to the Director*
FRANK STOLL, *Registrar and Custodian*
WILLIAM H. DURKIN, *Membership Secretary*

LAURA M. BREWSTER, *Stenographer*
ALVHILD LENNEA WIMAN, *Stenographer*

LOUIS BUHLE, *Photographer*

* The names are arranged alphabetically.

BROOKLYN
BOTANIC GARDEN
RECORD

VOL. XIV JANUARY, 1925 No. 1

LIST OF SEEDS

COLLECTED DURING THE YEAR 1924 AND OFFERED IN EXCHANGE

The seeds here listed are offered in exchange to institutions participating in the international seed exchange, and to our other regular correspondents. They will also be supplied, in limited quantities, to members of the Brooklyn Botanic Garden.

From 1914 to 1923 this list was issued in December as a separate publication, entitled *List of Seeds*. Hereafter it will appear in the January issue of the Brooklyn Botanic Garden RECORD.

PTERIDOPHYTA

Lycopodiaceae

Lycopodium
- clavatum
- complanatum

Marattiaceae

Angiopteris
- evecta

Osmundaceae

Todea
- barbara

Polypodiaceae

Adiantum
- cuneatum
- cuneatum var. Croweanum
- hispidulum
- trapeziforme

Aglaomorpha
- Meyeniana

Asplenium
- nidus
- platyneuron

Blechnum
- occidentale

Davallia
- pentaphylla

Diplazium
- lanceum
- zeylanicum

Doodia
blechnoides
Dryopteris
erythrosora
opaca
Sieboldii
Microlepia
majuscula
Nephrolepis
acuminata
cordifolia
rivularis
Oleandra
articulata
Phegopteris
Dryopteris
Polypodium
aureum
aureum var. areolatum
aureum var. cristatum
punctatum
subauriculatum
vulgare
Polystichum
acrostichoides
capense
Pteris
cretica var. Wimsettii
Tectaria
cicutaria

Schizaeaceae

Aneimia
phyllitidis

Selaginellaceae

Selaginella
Emmeliana
Emmeliana var. aurea
Wildenovii

GYMNOSPERMAE

Ginkgoaceae

Ginkgo
biloba

Pinaceae

Abies
balsamea
Pinus
rigida
Tsuga
canadensis

Taxaceae

Taxus
canadensis
cuspidata

DICOTYLEDONES

Acanthaceae 266

Acanthus
longifolius

Aizoaceae 84

Mesembryanthemum
curviflorum
pomeridianum
pyropeum
spectabile
Mollugo
verticillata
Tetragonia
expansa

Amarantaceae 79

Aerua
sanguinolenta
Alternanthera
paronychioides
Amarantus
blitoides
caudatus
caudatus (yellow)
crispus
graecizans
retroflexus
sylvestris
Celosia
argentea
cristata
plumosa
plumosa (yellow)

Deeringia
baccata

Anacardiaceae 153

Rhus
glabra
Toxicodendron
typhina
vernix

Apocynaceae 247

Amsonia
Tabernaemontana
Rhazya
orientalis

Aquifoliaceae 157

Ilex
crenata
glabra
opaca
serrata
verticillata

Araliaceae 227

Acanthopanax
divaricatus
Aralia
cordata
hispida
nudicaulis
racemosa
spinosa

Asclepiadaceae 248

Asclepias
syriaca
Cynanchum
nigrum
Vincetoxicum

Balsaminaceae 168

Impatiens
Balsamina
biflora
Roylei
scabrida

Basellaceae 86

Basella
rubra
rubra var. alba

Berberidaceae 93

Berberis
aggregata
heteropoda

Betulaceae 61

Betula
japonica var. mandshurica
papyrifera

Bignoniaceae 258

Catalpa
bignonioides

Borraginaceae 252

Anchusa
officinalis
Caccinia
strigosa
Echium
vulgare
Lithospermum
distichum
Myosotis
alpestris

Cactaceae 210

Opuntia
Lindheimeri

Campanulaceae 276

Campanula
caespitosa
carpatica
carpatica var. alba
carpatica var. turbinata
latifolia
latifolia var. alba
latifolia var. eriocarpa
persicifolia
punctata
rotundifolia
rotundifolia var. Hostii

Jasione
montana
Phyteuma
Scheuchzeri
Platycodon
grandiflorum
Mariesii
Trachelium
caeruleum
Wahlenbergia
dalmatica

Campanulaceae
—Lobelioideae 276a

Downingia
pulchella
Laurentia
tenella
Lobelia
cardinalis
Erinus
inflata
syphilitica

Capparidaceae 107

Cleome
spinosa
spinosa (white form)
Polanisia
trachysperma

Caprifoliaceae 271

Lonicera
japonica var. Halliana
Maackii var. podocarpa
pileata
quinquelocularis
quinquelocularis var. translucens
Ruprechtiana
syringantha
Webbiana
Sambucus
canadensis
Symphoricarpos
albus
occidentalis var. Heyeri
Viburnum
acerifolium
hupehense
Opulus var. americanum
pubescens var. affine
rufidulum
theiferum
tomentosum

Caryophyllaceae 87

Arenaria
graminifolia
stricta
Cerastium
Biebersteinii
Thomasii
tomentosum
Dianthus
Armeria
caesius
deltoides
gallicus
glacialis var. neglectus
petraeus
plumarius
sylvestris
Gypsophila
elegans
cerastioides
libanotica
perfoliata
repens
Lychnis
alba
alpina
chalcedonica
Coronaria
dioica
Flos-cuculi
Flos-Jovis
Githago
Haageana
Sartori
Viscaria var. splendens
Sagina
procumbens

Saponaria
caespitosa
ocymoides
ocymoides var. versicolor
officinalis
Vaccaria
Scleranthus
annuus
Silene
alpestris
ciliata
Friwaldskyana
maritima
noctiflora
pendula
Schafta
Zawadskii
Spergula
sativa
Tunica
Saxifraga

Celastraceae 158

Celastrus
orbiculatus
scandens
Euonymus
alata
Bungeana
europaea
oxyphylla

Cercidiphyllaceae 90a

Cercidiphyllum
japonicum

Chenopodiaceae 78

Chenopodium
Bonus-Henricus
capitatum
Kochia
hyssopifolia
trichophylla

Cistaceae 193

Helianthemum
canum
Chamaecistus var. mutabile

Clethraceae 230

Clethra
alnifolia

Compositae 280

Achillea
ageratifolia
alpina
filipendulina
Ptarmica
tomentosa
Actinomeris
alternifolia
Ageratum
Houstonianum
Houstonianum (White Form)
Arctotis
grandis
Arnica
Chamissonis
foliosa
Artemisia
Purshiana
sacrorum var. viride
sericea
vulgaris
Aster
alpinus
alpinus var. albus
novae-angliae "Mrs. S. T. Wright"
novi-belgii "Belgian Queen"
novi-belgii "Bluebeard"
novi-belgii "Climax"
novi-belgii "King Albert"
novi-belgii "King-of-the-Blues"
novi-belgii "Maggie Perry"
novi-belgii "Marne"
novi-belgii "President"
novi-belgii "Saturn"
novi-belgii "Snowball"
novi-belgii "The Queen"
Pattersoni

Bellium
bellidioides
Brauneria
purpurea
Cacalia
suaveolens
Calendula
officinalis
suffruticosa
Callistephus
chinensis
Centaurea
calvescens
Cyanus
dealbata
montana
Scabiosa
vochinensis
Chrysanthemum
coccineum
coronarium
Parthenium
Cnicus
benedictus
Coreopsis
grandiflora
tinctoria
Cosmos
bipinnatus
Cryptostemma
calendulaceum
Dimorphotheca
annua
aurantiaca
Erigeron
speciosus
Erlangea
tomentosa
Eupatorium
purpureum
Purpusii
Gaillardia
aristata
Gymnolomia
multiflora
Helianthus
annuus
divaricatus
mollis
Helichrysum
bracteatum
Heliopsis
helianthoides var. Pitcheriana
Inula
Helenium
squarrosa
Leontopodium
alpinum
Leptosyne
Stillmannii
Matricaria
Chamomilla
inodora
Onopordon
Acanthium
Rudbeckia
hirta
Sanvitalia
procumbens
Senecio
adonidifolius
Biebersteinii
clivorum
macrophyllus
Petasitis
Silphium
perfoliatum
Solidago
canadensis
Cutleri (S. Virgaurea var. alpina)
juncea
Stokesia
laevis
laevis var. alba
Tagetes
patula
Vernonia
altissima

Xanthium
spinosum
Ximenesia
encelioides
Zinnia
Haageana
verticillata

Compositae

—*Cichorieae 280a*

Catananche
caerulea
caerulea var. bicolor
Cichorium
Intybus
Hieracium
aurantiacum
Bocconei
rigidum
Picridium
vulgare
Picris
echioides
Sonchus
palustris

Convolvulaceae 249

Convolvulus
mauritanicus

Cornaceae 229

Cornus
alba
canadensis
florida
Kousa
paucinervis
racemosa

Crassulaceae 115

Bryophyllum
crenatum
Cotyledon
" Hoveyi "
Echeveria
gibbiflora var. metallica
microcalyx
Pringlei
Sedum
acre
Aizoon
Fabaria
hybridum
kamtschaticum
Nevii
sexangulare
spectabile
Sempervivum
arachnoideum
Braunii

Cruciferae 105

Alyssum
argenteum
saxatile
saxatile var. compactum
Arabis
albida
Lemmoni
procurrens
Berteroa
incana
Bunias
orientalis
Camelina
sativa
Capsella
grandiflora
Cheiranthus
Cheiri
kewensis
Diplotaxis
tenuifolia
Draba
aizoides
rupestris
Iberis
saxatilis
sempervirens
Isatis
tinctoria
Malcomia
maritima

Cucurbitaceae 275
Cucumis
Melo
Ecballium
Elaterium
Lagenaria
leucantha
Luffa
acutangula
cylindrica (aegyptiaca)

Dipsacaceae 274
Cephalaria
ambrosioides
Graeca
Scabiosa
amoena
atropurpurea
caucasica

Droseraceae 112
Drosera
rotundifolia

Ebenaceae 240
Diospyros
virginiana

Elaeagnaceae 215
Elaeagnus
umbellata

Empetraceae 151
Empetrum
nigrum

Ericaceae 233
Gaultheria
procumbens
Kalmia
angustifolia
latifolia
Ledum
groenlandicum
Leucothoe
Catesbaei
Lyonia
mariana
Oxydendrum
arboreum
Rhododendron
maximum

Ericaceae
—Vaccinioideae 233a
Vaccinium
canadense
pennsylvanicum
pennsylvanicum var. nigrum

Euphorbiaceae 147
Dalechampia
Roezliana
Euphorbia
Gerardiana
maculata
marginata
myrsinites
Ricinus
communis

Gentianaceae 246
Gentiana
crinita
Cruciata
thibetica
Nymphoides
peltatum

Geraniaceae 129
Geranium
albiflorum
Grevilleanum
pratense
sylvaticum

Guttiferae 187
Hypericum
Ascyron
patulum
quadrangulum
tomentosum

Hamamelidaceae 123
Hamamelis
virginiana

Liquidambar
Styraciflua

Hydrophyllaceae 251

Hydrolea
spinosa
Hydrophyllum
canadense
Phacelia
sericea
tanacetifolia

Labiatae 254

Agastache
nepetoides
Dracocephalum
Moldavica
Elsholtzia
Stauntonii
Galeopsis
pyrenaica
Hyssopus
officinalis
Lamium
album
Lavandula
vera
Leonurus
Cardiaca
Moluccella
laevis
Monarda
Bradburiana
Nepeta
macrantha
nuda
Perilla
nankinensis
Phlomis
alpina
tuberosa
Prunella
vulgaris
Rosmarinus
officinalis
Salvia
argentea
azurea var. grandiflora
hians
Horminum
pratensis var. Baumgartenii
Scutellaria
alpina
alpina (prostrate form)
peregrina
Sideritis
scordioides
Stachys
lanata
officinalis
sylvatica
Trichostema
dichotomum

Lauraceae 102

Benzoin
aestivale

Leguminosae
—Caesalpinioideae 127b

Cassia
marilandica
nictitans
Gleditschia
triacanthos
Gymnocladus
dioica

Leguminosae
—Mimosoideae 127a

Mimosa
pudica

Leguminosae
—Papilionatae 128

Amorpha
fruticosa
Anthyllis
Vulneraria
Arachis
hypogaea

Astragalus
Cicer
Glycyphyllos
Baptisia
australis
Caragana
arborescens
microphylla
Clitoria
Ternatea
Coronilla
Emerus
varia
Cytisus
nigricans
scoparius
Dolichos
Lablab
Galega
officinalis
Genista
sagittalis
Glycine
Soja (black seeds)
Soja (brown seeds)
Soja (yellow seeds)
Laburnum
alpinum
Watereri
Lathyrus
Cicera
latifolius
" Mary Lovett "
sylvestris var. Wagneri
Lespedeza
capitata
Lupinus
luteus
polyphyllus
polyphyllus var. albiflorus
Medicago
sativa
Ononis
arvensis
Ornithopus
perpusillus
Oxytropis
campestris
hybrida
Phaseolus
vulgaris
Robinia
Boyntonii
hispida
Securigera
Coronilla
Themopsis
montana
Trigonella
Foenum-Graecum

Linaceae 132

Linum
angustifolium
flavum
perenne
salsoloides
usitatissimum

Loganiaceae 245

Buddleia
albiflora
Davidii
Davidii var. magnifica
Davidii var. Veitchiana

Lythraceae 216

Cuphea
lanceolata
procumbens
Decodon
verticillatus
Heimia
myrtifolia
Lythrum
Salicaria
Salicaria var. roseum

Magnoliaceae 95

Liridodendron
Tulipifera
Magnolia
tripetala

Malvaceae 175

Abutilon
- Theophrasti

Althaea
- officinalis

Anoda
- lavateroides

Hibiscus
- cannabinus
- militaris
- Sabdariffa
- Trionum

Kitaibelia
- vitifolia

Malva
- crispa
- verticillata

Malvaviscus
- arboreus

Martyniaceae 260

Martynia
- lutea

Moraceae 64

Dorstenia
- Contrajerva

Ficus
- diversifolia

Maclura
- pomifera

Myricaceae 57

Myrica
- carolinensis

Myrtaceae 222

Myrtus
- communis

Nyctaginaceae 80

Mirabilis
- Jalapa
- Jalapa (pink form)
- Jalapa (yellow form)

Oxybaphus
- nyctagineus

Nymphaeaceae 88

Nymphaea
- ampla
- caerulea
- capensis
- dentata var. superba
- ovalifolia
- pulcherrima
- zanzibariensis var. rosea
- " Mrs. C. W. Ward "
- " Mrs. Woodrow Wilson "
- " Panama Pacific "

Nyssaceae 226b

Nyssa
- sylvatica

Oleaceae 243

Fraxinus
- longicuspis

Ligustrum
- Ibota var. Regelianum
- medium
- ovalifolium
- vulgare var. atrovirens

Syringa
- Emodi
- japonica

Onagraceae 224

Boisduvalia
- densiflora

Clarkia
- pulchella

Epilobium
- angustifolium
- clavatum
- nummularifolium

Oenothera
- acaulis
- fruticosa
- fruticosa var. major
- missouriensis
- pumila

Oxalidaceae 130

Oxalis
- valdiviensis

Papaveraceae 104
Argemone
mexicana
Bocconia
cordata
microcarpa
Chelidonium
majus
majus var. laciniatum
Eschscholtzia
californica
Glaucium
flavum
Papaver
floribundum
lateritium
nudicaule
orientale
Rhoeas
Sanguinaria
canadensis

Papaveraceae
—Fumarioideae 104a
Corydalis
lutea
Dicentra
eximia

Phytolaccaceae 83
Phytolacca
decandra

Piperaceae 53
Peperomia
pellucida

Plantaginaceae 269
Plantago
palmata

Plumbaginaceae 238
Acantholimon
glumaceum
Armeria
vulgaris
vulgaris var. Laucheana
Limonium
latifolium
vulgare

Polemoniaceae 250
Gilia
achilleaefolia
aggregata
dianthoides
Phlox
Drummondii
Polemonium
reptans

Polygonaceae 77
Eriogonum
umbellatum
Polygonum
Auberti
Sieboldii
Rheum
Rhaponticum
Rumex
occidentalis

Portulacaceae 85
Anacampseros
arachnoides
Calandrinia
discolor
grandiflora
Portulaca
grandiflora
marginata
oleracea
Talinum
patens

Primulaceae 237
Anagallis
arvensis
arvensis var. caerulea
Androsace
lanuginosa
maxima
Dodecatheon
Meadia

Lysimachia
dubia
punctata
Primula
floribunda
frondosa
japonica
kewensis
sinensis
verticillata
Steironema
ciliatum

Pyrolaceae 231

Chimaphila
umbellata
Monotropa
Hypopitys
uniflora
Pyrola
americana

Ranunculaceae 91

Actaea
alba
rubra
Anemone
parviflora
patens var. Nuttalliana
Aquilegia
chrysantha var. nana
vulgaris
vulgaris (pink form)
Cimicifuga
racemosa
Clematis
integrifolia
recta
virginiana
Coptis
trifolia
Delphinium
Consolida
grandiflorum
grandiflorum var. album
Nigella
damascena
Garidella
hispanica
Paeonia
suffruticosa
Ranunculus
Cymbalaria
nemorosus
Thalictrum
angustifolium
minus
polygamum
Trollius
caucasicus
laxus

Resedaceae 108

Reseda
alba
crystallina
odorata
Phyteuma

Rhamnaceae 169

Rhamnus
cathartica
Frangula

Rosaceae 126

Acaena
myriophylla
Agrimonia
odorata
pilosa
Alchemilla
splendens
vulgaris
Duchesnea
indica
Filipendula
purpurea
Fragaria
vesca var. alba
Geum
urbanum

Gillenia
trifoliata
Margyricarpos
setosus
Physocarpus
opulifolius
Potentilla
argentea var. Calabra
chrysantha
grandiflora
Hopwoodiana
nepalensis
nevadensis
Nuttallii
pennsylvanica
rupestris
tridentata
viscosa
Rhodotypos
kerrioides
Rosa
alba
multiflora var. cathayensis
Rubus
idaeus var. aculeatissimus
odoratus
Sanguisorba
tenuifolia
Sibbaldia
procumbens
Sorbaria
arborea var. glabrata
Lindleyana
sorbifolia
Spiraea
Billiardii
Margaritae

Rosaceae

—Pomoideae 126a

Amelanchier
canadensis
Aronia
arbutifolia
melanocarpa
Cotoneaster
bullata
Dielsiana
divaricata
foveolata
horizontalis
horizontalis var. perpusilla
moupinensis
nitens
Crataegus
Arnoldiana
barbara
coccinioides
compta
Dunbari
durobrivensis
effera
gloriosa
mollis
persimilis
Malus
atrosanguinea
baccata
floribunda
ioensis
micromalus
Scheideckeri
Zumi
Photinia
villosa
Pyrus
betulaefolia
Raphiolepis
umbellata
Sorbus
americana

Rosaceae

—Prunoideae 126b

Prunus
pennsylvanica
virginiana

Rubiaceae 270

Asperula
tinctoria

Galium
boreale

Rutaceae 137

Citrus
grandis
Dictamnus
albus
albus var. rubra
Evodia
rutaecarpa
Phellodendron
amurense
Ptelea
trifoliata
Ruta
graveolens

Sapindaceae 165

Koelreuteria
paniculata

Sarraceniaceae 110

Sarracenia
purpurea

Sauruaceae 52

Houttuynia
cordata

Saxifragaceae 117

Astilbe
Davidii
" Salland "
Boykinia
rotundifolia
Mitella
diphylla
Saxifraga
rotundifolia
Tellima
grandiflora

Saxifragaceae
—Hydrangeoideae 117a

Deutzia
longifolia
rosea var. eximia
scabra fl. pl.
scabra var. candidissima
Hydrangea
arborescens
quercifolia
Philadelphus
coronarius var. acuminatus
incanus
inodorus
laxus
Lemoinei

Saxifragaceae
—Ribesioideae 117b

Ribes
aureum
vulgare var. macrocarpum

Scrophulariaceae 257

Antirrhinum
Asarina
majus
maurandioides
sempervirens
Calceolaria
scabiosaefolia
Chaenostoma
foetidum
Digitalis
ambigua
lutea
Linaria
Cymbalaria
maroccana
Mimulus
cardinalis
Langsdorfii
luteus
Pentstemon
acuminatus
diffusus
glaber
gracilis
grandiflorus
laevigatus
laevigatus var. Digitalis
secundiflorus
unilateralis

Scrophularia
grandiflora
marilandica
Verbascum
Blattaria
Thapsus
Veronica
austriaca
incana
longifolia
repens
rupestris
spicata var. rosea
Teucrium var. prostrata

Solanaceae 256

Atropa
Belladonna
Capsicum
annuum var. longum
Datura
meteloides
Stramonium
Hyoscyamus
aureus
Lycium
chinense
halimifolium
Lycopersicum
cerasiforme
Nicandra
Physalodes
Nicotiana
affinis
glauca
rustica
Tabacum
Petunia
hybrida
Physalis
Franchetii
Salpiglossis
sinuata
Solanum
Capsicastrum
carolinense
Dulcamara
integrifolium

Stylidiaceae 278

Stylidium
adnatum

Styracaceae 242

Halesia
carolina
Styrax
japonica

Symplocaceae 241

Symplocos
paniculata

Tamaricaceae 191

Myricaria
germanica

Tiliaceae 174

Corchorus
olitorius

Ulmaceae 63

Celtis
occidentalis
Zelkova
ulmoides

Umbelliferae 228

Anethum
graveolens
Archangelica
officinalis
Coriandrum
sativum
Eryngium
alpinum
coeruleum
giganteum
planum
Levisticum
officinale
Oenanthe
pimpinelloides

Osmorhiza
Claytoni
Silaus
pratensis
Trachymene
caerulea

Urticaceae 65

Laportea
moroides
Parietaria
officinalis

Verbenaceae 253

Clerodendron
trichotomum
Lippia
nodiflora
Verbena
erinoides
urticaefolia
venosa
Vitex
Agnus-castus
Negundo var. incisa

Vitaceae 170

Ampelopsis
heterophylla
Parthenocissus
quinquefolia
Vitis
bicolor

MONOCOTYLEDONES

Amaryllidaceae 340

Zephyranthes
texana

Araceae 323

Aglaonema
commutatum
Arisaema
triphyllum
Peltandra
virginica
Schismatoglottis
Roebelinii
Spathiphyllum
floribundum
Symplocarpus
foetidus

Bromeliaceae 332

Aechmea
Barleei
Dyckia
rariflora
remotiflora

Commelinaceae 333

Palisota
Barteri
Rhoeo
discolor
Tinantia
fugax
Tradescantia
montana
virginiana var. alba

Cyperaceae 320

Carex
crinita
flava
Cyperus
alternifolius
Kyllinga
triceps

Gramineae 319

Avena
brevis
nuda
sativa
sativa var. orientalis
sterilis
strigosa
Briza
maxima
Bromus
secalinus

Coix
Lachryma-Jobi
Festuca
elatior
Holcus
Sorghum "Blackhull Kafir"
Sorghum "Darso"
Sorghum "Shallu"
Sorghum "Sumac Sorgo"
Sorghum "Feterita"
Sorghum "White Milo"
Lolium
perenne
Milium
effusum
Miscanthus
saccharifer
sinensis var. gracillimus
Oryza
sativa
Panicum
miliaceum
Pennisetum
japonicum
macrostachyum
Phalaris
arundinacea var. picta
Secale
cereale
Setaria
italica
Uniola
latifolia

Iridaceae 344

Iris
graminea
Pseudacorus
sibirica
sibirica var. flexuosa
spuria
tectorum
tectorum var. alba
versicolor
"Blue King"
"Ma Mie"
"Parc de Neuilly"
Lapeyrousia
cruenta
Sisyrinchium
bermudiana
iridifolium

Liliaceae 338

Allium
fistulosum
Porrum
Schoenoprasum var. sibiricum
senescens
Aloe
distans
Asparagus
officinalis
Sprengeri
Calochortus
Gunnisonii
Chlorophytum
Orchidastrum
Clintonia
borealis
Dianella
caerulea
Galtonia
candicans
Hemerocallis
Thunbergii
Maianthemum
canadense
Medeola
virginiana
Muscari
racemosum
Nothoscordum
fragrans
Oakesia
sessilifolia
Polygonatum
biflorum
Smilacina
racemosa

Streptopus
roseus
Trillium
cernuum
undulatum
Tulipa
dasystemon
Yucca
filamentosa

Taccaceae 342

Schizocapsa
plantaginea
Tacca
cristata

Zingiberaceae 346

Brachychilus
Horsfieldi

Applications for seeds should be received not later than March 1, 1925.

Address all requests to

CURATOR OF PLANTS,
Brooklyn Botanic Garden,
Brooklyn, N. Y., U. S. A.

The Brooklyn Institute of Arts and Sciences

OFFICERS OF THE BOARD
OF TRUSTEES

PRESIDENT
FRANK L. BABBOTT

FIRST VICE-PRESIDENT
WALTER L. CRITTENDEN

SECOND VICE-PRESIDENT
EDWARD C. BLUM

THIRD VICE-PRESIDENT
WILLIAM A. PUTNAM

TREASURER
G. FOSTER SMITH

SECRETARY
JOHN H. DENBIGH

BOTANIC GARDEN GOVERNING COMMITTEE

FRANK BAILEY, *Chairman*

FRANK L. BABBOTT, *Ex officio*
MRS. WILLIAM H. CARY
WALTER H. CRITTENDEN
GATES D. FAHNESTOCK
MRS. LEWIS W. FRANCIS
JOHN W. FROTHINGHAM
MISS HILDA LOINES
EDWIN P. MAYNARD
WILLIAM A. PUTNAM
AUGUSTUS M. WHITE

EX OFFICIO MEMBERS OF THE BOARD

THE MAYOR OF THE CITY OF NEW YORK
THE PRESIDENT OF THE BOROUGH OF BROOKLYN
THE COMMISSIONER OF PARKS, BOROUGH OF BROOKLYN

GENERAL INFORMATION

MEMBERSHIP.—All persons who are interested in the objects and maintenance of the Brooklyn Botanic Garden are eligible to membership. Members enjoy special privileges. Annual Membership, $10 yearly; Sustaining Membership, $25 yearly; Life Membership, $500. Full information concerning membership may be had by addressing *The Director, Brooklyn Botanic Garden, Brooklyn, N. Y.* Telephone, 6173 Prospect.

THE BOTANIC GARDEN is open free to the public daily from 8 a.m. until dark; on Sundays and Holidays open at 10 a.m.

ENTRANCES.—On Flatbush Avenue, near Empire Boulevard (Malbone Street), and near Mt. Prospect Reservoir; on Washington Avenue, south of Eastern Parkway and near Empire Boulevard; on Eastern Parkway, west of the Museum Building.

The street entrance to the Laboratory Building is at 1000 Washington Avenue, opposite Montgomery Street.

TO ASSIST MEMBERS and others in studying the collections the services of a docent may be obtained. This service is free of charge to *members of the Botanic Garden;* to others there is a charge of 50 cents per person. Arrangements must be made by application to the Curator of Public Instruction at least one week in advance. No parties of less than six adults will be conducted.

TO REACH THE GARDEN take Broadway (B.M.T.) Subway to Prospect Park station; Interborough Subway to Eastern Parkway-Brooklyn Museum Station; Flatbush Avenue trolley to Empire Boulevard; Franklin Avenue, Lorimer Street, and Tompkins Avenue trolleys to Washington Avenue; St John's Place trolley to Sterling Place and Washington Avenue; Union Street and Vanderbilt Avenue trolleys to Prospect Park Plaza and Union Street.

PUBLICATIONS
OF THE
BROOKLYN BOTANIC GARDEN

RECORD. Established, January, 1912. An administrative periodical issued quarterly. Contains, among other things, the *Annual Report* of the director and heads of departments, special reports, announcements of courses of instruction, miscellaneous papers, and notes concerning Garden progress and events. Free to members of the Garden. To others one dollar a year; 25 cents a copy.

MEMOIRS. Established, July, 1918. Published irregularly.

Volume I, *Dedication Papers:* comprising scientific papers presented at the dedication of the laboratory building and plant houses, April 19–21, 1917. Price $3.50, plus postage.

Volume II. The vegetation of Long Island. Part I, The vegetation of Montauk: A study of grassland and forest. Price $1.00, plus postage.

CONTRIBUTIONS. Established, April 1, 1911. Papers originally published in periodicals, reissued as "separates," without change of paging, and numbered consecutively. This series includes occasional papers, as well as those embodying the results of research done at the Garden, or by members of its staff or students. Twenty-five numbers constitute one volume. Price 25 cents each, $5.00 a volume.

27. The origin of new varieties of Nephrolepis by orthogenetic saltation. II. Regressive variation or reversion from the primary and secondary sports of Bostoniensis. 18 pages, 6 plates. 1922.

28. *Botanical exploration in Bolivia.* 13 pages. 1922.

29. *Anthracnose of the Boston fern.* 7 pages, 2 plates. 1923.

30. *Varietal resistance and susceptibility of Sorghums to Sphacelotheca Sorghi (Link) Clinton and Sphacelotheca Cruenti (Kühn) Potter.* 12 pages, 2 plates. 1923.

31. *The Melanconis disease of the butternut (Juglans cinerea L.).* 23 pages, 2 plates, 5 figs. 1923.

32. *New bud sports of Nephrolepis.* 21 pages, 2 plates, 4 figures. 1923.

35. Factors influencing infection of Hordeum sativum by Ustilago hordei. 26 pages, 2 plates, 7 figures. 1924.

36. Influence of environmental factors on the infection of Sorghums and Oats by smuts. I. Experiments with covered and loose kernel smuts of Sorghum. 17 pages, 7 figures. 1924.

LEAFLETS. Established, April 10, 1913. Published weekly or biweekly during April, May, June, September, and October. The purpose of the *Leaflets* is primarily to give announcements concerning flowering and other plant activities to be seen in the Garden near the date of issue, and to give popular, elementary information about plant life for teachers and others. Free to members of the Garden. To others, fifty cents a series. Single numbers 5 cents each.

GUIDES to the collections, buildings, and grounds. Price based upon cost of publication.

SEED LIST. Established, December, 1914. Since 1925 issued each year in the January number of the RECORD.

AMERICAN JOURNAL OF BOTANY. Established, January, 1914. Published, in coöperation with the BOTANICAL SOCIETY OF AMERICA, monthly, except during August and September. Subscription, $6.00 a year.

ECOLOGY. Established, January, 1920. Published quarterly in coöperation with the ECOLOGICAL SOCIETY OF AMERICA. Subscription, $4.00 a year.

GENETICS. Established, January, 1916. Bi-monthly. Subscription, $6.00 a year.

BROOKLYN BOTANIC GARDEN RECORD

VOL. XIV APRIL, 1925 NO. 2

FOURTEENTH ANNUAL REPORT

OF THE

BROOKLYN BOTANIC GARDEN

1924

"What use is there in knowledge unless we do those things for which knowledge is profitable?"

—*Maximus of Tyre.*

"The science which has for its object a knowledge of plants, and which is particularly given the name Botany is, I do not hesitate to say, of all the sub-divisions of Natural History, that which presents at the same time the most numerous objects of utility and the most variable enjoyment."—*Chevalier de Lamarck.*

FOR THE ADVANCEMENT AND DIFFUSION
OF A KNOWLEDGE AND LOVE OF PLANTS

PUBLISHED QUARTERLY
AT LANCASTER, PA.
BY THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES
BROOKLYN, N. Y.

Entered as second-class matter at the postoffice at Lancaster, Pa., under act of August 24, 1912.

BROOKLYN BOTANIC GARDEN

Scientific, Educational, and Administrative Officers

SCIENTIFIC AND EDUCATIONAL

The Staff*

C. STUART GAGER, Ph.D., Sc.D., Pd.D., *Director*
MONTAGUE FREE, *Horticulturist*
ARTHUR HARMOUNT GRAVES, Ph.D., *Curator of Public Instruction*
ALFRED GUNDERSEN, Docteur de l'Université (Paris), *Curator of Plant Life*
ELSIE TWEMLOW HAMMOND, M.A., *Assistant Curator of Elementary Instruction*
GEORGE M. REED, Ph.D., *Curator of Plant Pathology*
ELLEN EDDY SHAW, B.S., *Curator of Elementary Instruction*
RAY SIMPSON, *Librarian*
NORMAN TAYLOR, *Curator of Plants and Plantations*
ORLAND E. WHITE, Sc.D., *Curator of Plant Breeding and Economic Plants*

Other Officers

MARY AVERILL, *Honorary Curator of Japanese Gardening and Floral Art*
HAROLD A. CAPARN, *Consulting Landscape Architect*

RALPH CURTISS BENEDICT, Ph.D., *Resident Investigator*

MAUDE L. HICKOK, *Instructor*
LAURA ALMA KOLK, M.A., *Research Assistant*
DOROTHY I. NEFF, A.B., *Research Assistant*
MABEL E. TURNER, B.S., *Instructor*

EDITH R. DALY, *Library Assistant*
MARGARET R. ELLIS, *Curatorial Assistant*
HELEN SMITH HILL, *Curatorial Assistant*
LOIS DAVIS VAN GORDEN, *Curatorial Assistant*
CHARLOTTE S. YOUNG, A.B., *Curatorial Assistant*

ADMINISTRATIVE

DANIEL C. DOWNS, *Secretary and Accountant*
MAUDE E. VORIS, *Assistant Secretary*
MARION S. GIBBS, *Business Office Assistant*

ANN C. OHLANDER, *Secretary to the Director*
FRANK STOLL, *Registrar and Custodian*
WILLIAM H. DURKIN, *Membership Secretary*

LAURA M. BREWSTER, *Stenographer*
ALVHILD LENNEA WIMAN, *Stenographer*

LOUIS BUHLE, *Photographer*

*The names are arranged alphabetically.

FOURTEENTH ANNUAL REPORT

OF THE

BROOKLYN BOTANIC GARDEN

1924

FOR EDUCATION
FOR INVESTIGATION
FOR THE SERVICE OF THE CITY

BROOKLYN, N. Y.
APRIL, 1925

LANCASTER PRESS, INC.
LANCASTER, PA.

SUMMARY

1. Substantial progress has been made toward making the Brooklyn Botanic Garden the most beautiful spot in Greater New York.

2. The Garden has actively cooperated in the State-wide movement for legislation for the preservation of native American wild flowers.

3. Contributions to botanical science have been made in the fields of plant pathology, genetics and plant breeding, ecology and plant geography, and systematic botany.

4. Over 1,600 pages of research have been published.

5. Important contributions have been made to educational practice.

6. Over 438,000 persons have visited the grounds.

7. Over 100,000 adults and children have attended classes and lectures.

8. Over 8,500 living plants have been placed in the classrooms of Brooklyn schools.

9. All High Schools and 90 per cent. of the Public Schools were served by the Garden.

10. Study material (mostly living plant material) was supplied to 10 out of 13 High Schools and 12 out of 13 Junior High Schools in quantity sufficient for the instruction of over 161,000 pupils.

11. Over 4,600 packets of seed of nearly 900 different kinds of American wild flowers and other plants were sent in exchange to foreign botanic gardens.

12. Over 204,000 packets of vegetable and flower seeds were supplied to Brooklyn children for planting in school and home gardens.

13. Current issues of over 800 periodicals on botany and related subjects were received in the Library, which is open free to the public daily.

14. Land for nursery, propagating houses, and experimental garden is a pressing need.

15. The report shows in detail the urgent necessity of an increase in annual income from permanent funds of not less than $100,000.

16. Attention is called to the advantages and privileges of membership in the Garden.

INFORMATION CONCERNING MEMBERSHIP

The Brooklyn Institute of Arts and Sciences is organized in three main departments: 1. The Department of Education. 2. The Museums. 3. The Botanic Garden.

Any of the following seven classes of membership may be taken out through the Botanic Garden:

1. Annual member	$ 10
2. Sustaining member	25
3. Life member	500
4. Permanent member	2,500
5. Donor	10,000
6. Patron	25,000
7. Benefactor	100,000

Sustaining members are annual members with full privileges in Departments one to three. Membership in classes two to seven carries full privileges in Departments one to three.

In addition to opportunities afforded to members of the Botanic Garden for public service through cooperating in its development, and helping to further its aims to advance and diffuse a knowledge and love of plants, to help preserve our native wild flowers, and to afford additional and much needed educational advantages in Brooklyn and Greater New York, members may also enjoy the privileges indicated on the following page.

Further information concerning membership may be had by addressing The Director, Brooklyn Botanic Garden, Brooklyn, N. Y., or by personal conference by appointment. Telephone, 6173 Prospect.

PRIVILEGES OF MEMBERSHIP

1. Free admission to the buildings and grounds at all times.
2. Cards of admission for self and friends to all exhibitions and openings preceding the admission of the general public, and to receptions.
3. Services of docent (by appointment), for self and party, when visiting the Garden.
4. Admission of member and his or her immediate family to all lectures, classes, field trips, and other scientific meetings under Garden auspices, at the Garden or elsewhere.
5. Special lectures and classes for the children of members.
6. Copies of Garden publications, as follows:

   a. Record
   b. Guides
   c. Leaflets
   d. Contributions
   e. Frequent Announcement Cards concerning plants in flower and other exhibits.

7. Privileges of the Library and Herbarium.
8. Expert advice on the choice and care of plants, indoors and out, on planting the home grounds, the care of lawns, and the treatment of plants affected by insect and fungous pests.
9. Identification of botanical specimens.
10. Participation in the periodical distribution of duplicate plant material and seeds, in accordance with special announcements sent to members from time to time.

THE BOTANIC GARDEN AND THE CITY

THE BROOKLYN BOTANIC GARDEN, established in 1910, is a Department of the Brooklyn Institute of Arts and Sciences. It is supported in part by municipal appropriations, and in part by private funds, including income from endowment, membership dues, and special contributions. Its articulation with the City is through the Department of Parks.

The City owns the land devoted to Garden purposes, builds, lights, and heats the buildings, and keeps them in repair, and includes in its annual tax budget an appropriation for other items of maintenance. One third of the cost of the present buildings (about $300,000) was met from private funds.

Appointments to all positions are made by the director of the Garden, with the approval of the Botanic Garden Governing Committee, and all authorized expenditures for maintenance are made in the name of the private organization, from funds advanced by the Institute, which, in turn, is reimbursed from time to time by the City, within the limits, and according to the terms, of the annual appropriation.

All plants have been purchased with private funds since the Garden was established. In addition to this, it has been the practice of the Garden to purchase all books for the library, all specimens for the herbarium, all lantern slides, and numerous other items, and to pay certain salaries, with private funds.

The urgent needs of the Garden for private funds for all purposes are more than twice as great as the present income from endowment, membership dues, and special contributions. The director of the Garden will be glad to give full information as to possible uses of such funds to any who may be interested.*

* A written *Agreement*, dated August 17, 1914, between the City of New York and the Institute, touching the Botanic Garden, published in full in the *Brooklyn Botanic Garden Record*, for April, 1915, amends the agreement of September 9, 1912, which amends the original agreement of September 28, 1909, published in the *Record* for January, 1912.

FORMS OF BEQUEST TO THE BROOKLYN BOTANIC GARDEN

Form of Bequest for General Purposes

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of.....Dollars, the income from which said sum to be used for the educational and scientific work of the Brooklyn Botanic Garden.

Form of Bequest for a Curatorship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of.....Dollars, as an endowment for a curatorship in the Brooklyn Botanic Garden, the income from which sum is to be used each year towards the payment of the salary of a curator in said Botanic Garden, to be known as the (here may be inserted the name of the donor or other person) curatorship.

Form of Bequest for a Fellowship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of.....Dollars, the income from which sum is to be used in the payment of a fellowship for advanced botanical investigation in the Brooklyn Botanic Garden, to be known as the .....fellowship.

Form of Bequest for other particular purposes designated by the testator

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of.....Dollars, to be used (or the income from which to be used) for the Brooklyn Botanic Garden *

.....

.....

* The following additional purposes are suggested for which endowment is needed.

1. Botanical research.
2. Publishing the results of botanical investigations.
3. Popular botanical publication.
4. The endowment of a lectureship, or a lecture course.
5. Botanical illustration for publications and lectures.
6. The purchase and collecting of plants.
7. The beautifying of the grounds.
8. The purchase of publications for the library.
9. Extending and enriching our work of public education.

FIG. 1. Bearded Iris. West side of the brook, facing south. June 5. (4954.)

BROOKLYN BOTANIC GARDEN RECORD

VOL. XIV APRIL, 1925 NO. 2

FOURTEENTH ANNUAL REPORT OF THE BROOKLYN BOTANIC GARDEN, 1924

REPORT OF THE DIRECTOR

TO THE GOVERNING COMMITTEE OF THE BOTANIC GARDEN:

I have the honor to present herewith the fourteenth annual report of the Brooklyn Botanic Garden, for the year 1924.

Steady Growth

The history of the year just ended discloses, as it should, an institution still in the vigor of youth. In fact, the Garden has violated the principles of physiology and has continued to grow and expand in spite of being under-nourished. This has been made possible by the stimulus of a favoring environment and by the devotion of every member of our organization to the purposes and ideals of the Garden.

Opportunity and Ideals

By the environment we mean the inspiration of opportunity. Almost any institution that ministers to the intellectual and social needs of a community will find abundant opportunity in a city of several million inhabitants. And the appeal of a botanic garden is many sided—recreational, aesthetic, scientific, educational. It serves not only the local community but also the wider world of science and education. To be parochial would diminish greatly its usefulness to the city. Municipal institutions are debtors to all state, federal, and foreign agencies for the promotion of science and education, and should endeavor, in some measure at least, to repay in kind. Are our collections enriched by seeds and plants from other institutions? Then we should also offer material in exchange. Do we find the

publications of others helpful? Then we should contribute to current scientific literature. Are our grounds beautified by the "creations," so-called, of the plant breeder? Then we should endeavor to make some contribution to a knowledge of plant breeding. Do we depend upon the most recent discoveries in plant pathology to keep our collections healthy? Then we, too, should contribute to the knowledge of plant diseases. Such *is* the ideal and, in part, the scope of the Brooklyn Botanic Garden *—to increase and diffuse a knowledge and love of plants.* We can hardly state it too often; we can hardly over-emphasize it—*scientific research and public education; this is the purpose and program of the Brooklyn Botanic Garden.*

What the Community Has Asked of Us

In an editorial review of our preceding annual report the writer, while commending the work, suggested that the community should ask itself whether it really wished such an institution. One never asks himself whether he wishes to eat when he is hungry. Brooklyn, and also adjacent Boroughs, are now too busy making use of the Brooklyn Botanic Garden to raise any question as to its need or usefulness.

The attendance at our classes and lectures during the year has been over 100,000 adults and children.

Over 204,000 packets of seeds have been supplied to Brooklyn children for planting in school and home gardens.

Over 1,100 teachers have sought conferences with members of staff concerning the teaching of botany and nature study.

Over 8,500 living plants have been placed in the classrooms of nearly every Brooklyn school. 90 per cent. of the Public Schools have made use of the Garden in one way or another.

Study material has been supplied to 10 out of 13 High Schools and to 12 out of 13 Junior High Schools.

Over 438,000 persons have visited our grounds.

Eighty-three addresses and lectures have been delivered by members of staff on invitation in Greater New York, outside of the Botanic Garden.

Almost daily requests by letter, telephone, and in person for information on plant life have been received and answered.

Thirty organizations have held meetings at the Garden, either to facilitate lectures on our work or closely related topics, or to include inspection of our collections in their program.

Innumerable artists have frequented our grounds for the purpose of sketching or painting views of the landscape or of individual plants and flowers.

Numerous commercial concerns in the City have been supplied with technical information on plant life and horticulture, in some cases where investments of large amounts of capital were involved.

Should one inquire whether the City really wants the Botanic Garden—whether it is serving a useful purpose, the answer is found in the annual record of achievement.

Contributions to Education

a. Teaching Small Groups vs. Lecturing to Audiences.—Through its department of Elementary Education the Garden has made several important contributions to current educational practice. Schools had been sending classes "*to visit*" museums, botanic gardens, and zoological parks for several years before the Brooklyn Botanic Garden was founded. The well established practice was for the classes to go in groups of 500–1,500 pupils at a time. This makes impressive figures of attendance, but yields smaller educational returns than almost anything that can be done with that number of elementary school pupils. The Brooklyn Botanic Garden early developed the plan of encouraging small groups (classes of 40), and special work with smaller groups of three or four, or only one or two. This reduced attendance, and required more instructors, but it meant education instead of merely information, teaching instead of lecturing; they are not synonymous.

b. Courses of Instruction vs. Unrelated Talks.—Prior to 1910 (when our work began) the almost universal practice was for classes or larger groups to visit a museum or garden once, for a lecture on a given topic. At the next visit the work was only slightly, if at all, related to that of the preceding visit. There was lack of continuity. The Brooklyn Botanic Garden lays special emphasis on a series of related class exercises—in fact on *courses* of instruction. Where isolated lectures are given they

are planned with reference to the course of study of the public schools and serve directly to supplement and enrich the regular work of the classroom.

c. Syllabi for Lectures and Garden Walks.—It is doubtful whether the time and effort expended in bringing classes from their schools to museums and botanic gardens is justified unless the work given at the Garden is definitely followed up afterwards in the school room. The stereopticon-, or motion-picture-lecture, or the field exercise at the Garden should be regarded, not so much as a lesson, but as *preparation for a lesson*, and everything possible should be done by the institution to insure this follow-up work by the regular teacher. To this end the Brooklyn Botanic Garden, a year or two ago, inaugurated the plan of giving each teacher a Syllabus of the lecture—one copy for each pupil, to be taken back to the school and to serve as the basis of the follow-up lesson. This was mentioned in our preceding report. During the year just passed the plan has been adopted of supplying each pupil with an outline of what he is expected to observe in his garden walk with the instructor. With this outline in hand and the object of his visit clearly stated, he proceeds at once to the particular exhibit he has come to see. The printed outline centers attention, makes the work concrete and definite, facilitates the follow-up work on the return to the school, and also tends to insure this work being done.

d. Laboratory-Greenhouse.—So far as we are informed, our laboratory-greenhouse for children of high school age or younger is still unique. Pupils come here voluntarily on Saturdays and on other days for *courses* of instruction in botany and nature study with plants. So strong is the appeal that many boys and girls have come for four, five, and even seven consecutive years. Many have discovered here their major interest in life, and have either gone to college to specialize in botany, agriculture, or horticulture, or have gone into the nursery or florist's business.

A more detailed statement of this work is given in the appended report of the curator of elementary instruction.

Cooperation with Schools

a. Public Schools.—The bringing of classes to the Botanic Garden has now become an established part of the program in most of the Public Schools of Brooklyn. We could hardly

FIG. 2. *Victoria cruziana* in flower. Conservatory Pool. October 30. (3769.)

accommodate more with our present staff and room-accommodations. Teachers brought to the Garden in 1924 over 49,800 pupils. The other work—conferences with teachers, supply of study material, loan lectures (lantern slides and text), addresses and talks to teachers, mothers' clubs, and pupils at the schools, the placing of living plants in school rooms, and other items—is noted in the report of the curator of elementary instruction and also on page 26.

b. High Schools.—Our service to high schools has increased greatly in bulk during 1924, including the supply of living study material for botany classes, sterilized culture medium (agar) for the study of bacteria and fungi, and demonstrations and lectures at the Garden to high school classes and class delegates.

In particular it should be noted that the Botanic Garden, during 1924, supplied study material for the instruction of over 161,000 pupils in high schools, training schools, colleges, and universities. The statistics of our educational work are summarized in the following table:

Statistics of Public Educational Activities, 1924

Conferences	
Number of teachers	1,151
Number of pupils involved	58,035
Loan Lectures (Lantern slides, etc.)	
Number of teachers	22
Number of pupils attending	5,858
Study Material Supplied	
Number of schools and annexes	
High	
In Brooklyn (Total No. 13)	10
Outside of Brooklyn	9
Junior High Schools (Total No. 13)	12
Colleges and Universities	3
Training Schools for Teachers	1
Elementary	206
Private Schools	9
Number of teachers	4,997
Number of pupils instructed	161,450
Exhibits provided	
Number of exhibits	17
Viewed by	14,609
Living plants placed in school rooms	
Number of schools	722
Number of plants	8,502
Agar (sterilized) for class use	
Petri dishes	1,180
Flasks	13
Seed Packets for children	
Schools	151
Teachers	4,321
Pupils	129,349
Packets	204,283

Investigations

Investigations at the Garden during 1924 have been along the same general lines as last year—plant pathology (with special reference to disease resistance), forest pathology, genetics and plant breeding, ecology (with special reference to the vegetation of Long Island), and systematic botany.

Some of the results of this work have been embodied in nine scientific papers published by members of staff during the year, and manuscript is now in hand for a *Memoir* on the vegetation of

Mt. Desert Island (Maine) in its relation to the vegetation of Long Island.

The Garden is indebted to Prof. R. A. Harper, of Columbia University, for placing at our disposal about one acre of good farm land near Ridgewood, N. J., for use in connection with Dr. Reed's experiments in disease resistance. This made it possible to conduct important work on a larger scale than could have been done if only our own limited experimental plot had been available.

Fuller details on the year's investigations are given in the appended Report on Research (p. 38).

Plantations and Grounds

Bulbs in the Lawn.—In the Botanic Garden RECORD for January, 1924, attention was called to the planting of nearly 47,000 bulbs in the fall of 1923. These bulbs came into flower last spring and greatly enhanced the beauty of the grounds for a period of several weeks. There were about 40,000 Crocuses, white, striped blue, and yellow (15,000 planted in 1923, the remainder planted in 1921); over 15,000 Daffodils, var. Emperor (5,000 planted in 1923, the remainder in 1921); 10,000 Poet's Narcissus of an early blooming kind (*Narcissus poeticus ornatus*); 3,000 Winter Aconite (*Eranthis hyemalis*), a very early bloomer; 1,000 Guinea Hen Flower (*Fritillaria Meleagris*); 5,000 Squills (*Scilla nutans major*); and 2,000 Snowdrops (*Galanthus Elwesii*).

In the fall of 1924 these plantings were still further increased by the addition of nearly 28,000 bulbs, as noted in the appended report of the Horticulturist (p. 54). All of these should come into bloom in the Spring of 1925.

Rock Garden.—The Rock Garden has been extended for about 60 feet southward on the east side of the paved walk.

The Companulales Area.—The fall work has included, besides the routine operations, the remaking of the area devoted to the Bellflowers, Asters, Sunflowers, Daisies, Thistles, Dandelions, and their relatives, *viz.*, the Campanulales. When the south addition was added to the Garden the General Systematic Section was revised and expanded on the map, and the Campanulales area is the last one to be revised in accordance with the new plan. About 5,500 square feet of new beds have been

made, each one involving excavation for 18–24 in., the removal of many stones, and refilling with top soil and fertilizer. The beds were also replanted and labelled. In the new beds provision is made for additional hardy asters and also for a representative collection of Dahlias.

Children's Garden.—About 50 Paul's Scarlet Climber roses were planted last spring along the east border of the Children's Garden. These will not only beautify the Garden, but will serve to screen out the Brighton Line railroad cut which passes here.

A new porch and approach walk of red tapestry brick have greatly improved the west front of the Children's Building.

Iris Garden.—Many new varieties, especially of Japanese forms, have been added, and two new beds made.

Top-soiling and Grading.—About three acres of the Garden still remain under the plow owing to shortage of labor. This is the area between the museum building and Mt. Prospect reservoir, fronting on Eastern Parkway.

International Seed Exchange

The reports on the International Seed Exchange by the curator of plants (p. 49) and the horticulturist and head gardener (p. 54), are worthy of note. Correspondence with other gardens by the curator of plants has revealed a very general desire for uniformity in nomenclature in place of the present diversity. Over 4,600 packets of seeds of nearly 900 species were sent to foreign gardens during 1924.

Conservation of Native Plants

During the year 1924 there has been considerably activity and progress in connection with the program for the conservation of native plants. During March an amendment to the Conservation Law of New York State was proposed and introduced in the State Legislature. By the terms of the proposed amendment native plants were to be recognized in the Conservation Law of the State as deserving protection on somewhat the same basis as that which now applies to wild animals. The amendment related to the so-called "Private Parks" Section of the

Conservation Law, and authorized land owners to post their property in behalf of wild plants on terms similar to those which now apply to animals. The amendment was passed by the State Senate but failed in the Assembly in the rush of the last days of the session.

The amendment represented the proposal of the Joint Committee appointed by four societies, the Wild Flower Preservation Society, the American Fern Society, the New York Bird and Tree Club, and the Torrey Botanical Club, which had met originally in May, 1923, at the Brooklyn Botanic Garden as reported last year. This committee has continued its activity under the chairmanship of Dr. G. Clyde Fisher, of the American Museum of Natural History, and with the addition of representatives of a number of other organizations.

On May 28 a second joint meeting of the several societies and individuals interested in this movement was held at the Garden. There were both forenoon and afternoon programs. In the afternoon a report of the Joint Committee was received. The meeting was also addressed by Dr. Homer D. House, New York State Botanist, who spoke in favor of wild flower conservation. A fuller account of the meeting has been published in the Botanic Garden RECORD for July, 1924.

A Brooklyn Botanic Garden *Leaflet* (Series XII, No. 2), entitled "The Conservation of Beauty," was prepared and widely distributed to aid in this movement.

Herbarium

From an administrative point of view it is important to note the statement in the report of the curator of plants (p. 48) that the herbarium collection has now about reached the capacity of the cases. It is only a question of a very short time before it will be necessary to provide a mezannine floor in the herbarium room to accommodate the necessary additional cases. The total increase of specimens in both herbaria during 1924 is approximately 2,500 specimens.

Library

Perhaps the most striking item in the appended report of the librarian is the increase in the use of the library. The attendance

was over 10,000, as against about 8,000 a year ago. For the last five years the figures for loans to members of staff have been 706, 956, 1,194, 1,315, 2,208. Since this is a reference library, books are not loaned outside of the building and only to members of staff—except inter-library loans.

Another feature, not emphasized in the librarian's report, is the disproportion between the amount of work to be done and the assistance available. There is great need for the full-time services of a trained cataloger.

Special attention is called to the fact that very few books have been bound for the past two years. There are now 1,000 or more books needing to be bound. Unbound publications are not only less usable, but are more liable to deterioration or loss of parts when in use.

A permanent fund sufficient to yield an annual income of not less than $2,000 is a most urgent need, and would contribute in a very substantial manner to the advancement of botanical science and education. Ultimately a larger permanent income will be needed.

Tenth Annual Spring Inspection

The Tenth Annual Spring Inspection of the Botanic Garden by trustees, Woman's Auxiliary, members, and invited guests was held on Tuesday afternoon, May 13, from 3:30 until 6:00 o'clock. About 650 guests were present. The success of this function is due in large measure to the work of the Woman's Auxiliary.

Membership

Canvass.—Previous to 1924 our canvass for new members had been conducted by mail. This year it was decided to adopt the telephone method, used so successfully by other institutions, and a membership secretary was appointed on February 18. By this method 219 new members have been secured and, in addition to this, several thousand persons have received a telephone call giving them information about the Garden. A classified list of members will be found on pages 102–114.

Distribution of Asters.—On March 27–28 cards were sent to the membership of the Botanic Garden offering duplicate roots of over 20 varieties of Michaelmas Daisies (horticultural varieties

FIG. 3. Japanese Garden in winter. Inari shrine in the distance. Lake in the foreground. January 4. (4409.)

of wild asters). These plants were originally obtained from Aldenham House Gardens (Estate of the late Hon. Vicary Gibbs) near London. The response kept the Department of Plants busy for several days. There were requests from about 70 individuals, and nearly 1,000 plants were distributed. The garden hopes to be able to serve its members in this way more frequently from now on.

Gifts

A list of gifts to the Botanic Garden may be found on pages 83–88 of this report. These have all been personally acknowledged with the thanks of the Governing Committee and the director. It is a pleasure to make public acknowledgment and thanks here also.

New Appointments and Resignations

Research Fellow.—Dr. James A. Faris, Research Fellow since November 15, 1921, accepted an appointment as National Research Fellow, National Research Council, effective July 1, and continued his residence at the Botanic Garden in order to carry on the various phases of his studies with covered smut of barley and bunt of wheat. He was appointed to the position of Senior Pathologist of the Tropical Research Foundation for the purpose of studying certain diseases of the sugar-cane in Cuba, and resigned his Fellowship on October 31.

Research Assistant.—The appointment of Miss Laura Alma Kolk, on February 1, as Research Assistant has enabled us to carry out some of the work in the cryptogamic herbarium. She has also rendered valuable assistance in connection with the experimental studies in progress.

Instructors.—Miss Edith Sanders (now Mrs. William O. Weber), whose appointment as instructor began on April 1, 1922, resigned on September 12, 1924.

Miss Mabel E. Turner, formerly a member of the faculty of the State Normal School, Worcester, Mass., was appointed instructor, in place of Mrs. Weber, for the period September 15, 1924–June 15, 1925.

Curatorial Assistant.—Mrs. Margaret Mann Burdick (now Mrs. Frank Putz), who had been with the Botanic Garden

continuously since May 1, 1914, resigned as of October 31, 1924. Subsequently she rendered temporary assistance in the herbarium. Mrs. Burdick's long connection with the Garden was evidence of the highly satisfactory services which she rendered, and her resignation was a matter of sincere regret to all concerned.

Miss Ethel V. Woodward was appointed temporary assistant in the Department of Elementary Instruction, beginning December 8.

Secretary and Accountant.—Mr. Henry W. Carr's appointment as secretary and accountant began April 1 and terminated November 30. The position had not been filled at the close of the year, Miss M. E. Voris, assistant secretary, serving as acting secretary and accountant.

Financial

Tax Budget Accounts

The municipal appropriation for maintenance for 1924 was $1,290.04 greater than for 1923 ($80,855.00 *vs.* $79,564.96). The increase was in the item for the purchase of coal, the reduced appropriation for 1923 having been quite inadequate.

Private Funds Accounts

a. Income.—The total private funds budget for 1924 ($55,543.45) was $1,515.38 greater than that for 1923 ($54,028.07).

Of the total Botanic Garden Budget for 1924 ($142,853.53), nearly 39% was provided from private funds. This percentage has gradually increased for several years past.

b. Permanent Funds.—The principal account of permanent funds has increased by $19,441.95 over a year ago. Of this amount $6,479.90 was on Endowment Increment Account.

c. Funds for Research.—The unexpended balance of the $50,000 pledged by Mr. Alfred T. White in his letter of November 15, 1920 to the Governing Committee, and available January 1, 1921, for Plant Disease research, will provide for the continuation of this project, as now organized, until the close of 1925. Mr. White's letter, above referred to, contained a statement expressing the hope that, before the amount of his pledge had been expended,

the work would so commend itself "as to enable us to secure from some of the Foundations a permanent endowment for this important department." Such endowment has not yet been secured, but it is a great pleasure to record here that, at a meeting of the Botanic Garden Governing Committee on May 21, a letter of May 1, 1924 was read containing an offer from three friends of the Garden who wish to remain anonymous, to underwrite $7,500 a year for the years 1926, 1927, and 1928 for the continuation of plant disease investigations. A fuller statement has already been published in the Botanic Garden RECORD for July, 1924. It is hoped that long before the expiration of this three year period an endowment may be secured to place this work on a permanent basis and provide for its natural expansion in accordance with plans already developed, and in proportion to its great scientific and economic importance. A further statement as to the financial needs of the Garden follows.

Needs of the Garden

In the opening paragraph of this report I stated that the Botanic Garden had continued to grow in spite of being undernourished. While our annual income and permanent funds are slightly larger than last year, this increase has been woefully small in proportion to our needs. This is, perhaps, the more common condition of scientific and educational institutions, but we can take some satisfaction in the thought that it means a useful institution—increasing demands for the kind of service we are rendering. Nevertheless the needs should be kept constantly before us, and unceasing effort should be made to meet them. They may be repeated in successive reports, until they are met. The more important needs are as follows:

Increased Endowment.—Among the purposes for which additional private funds are needed the following are the more important.

Summary of Items for which Additional Endowment is now Needed

FOR ANNUAL EXPENDITURES (Income from Endowment):		
Personal Service		
1. Salary increases	$ 20,000	
2. New positions	20,000	
3. Plant Pathology Research Project	50,000	
		$ 90,000
Other than Personal Service		
4. Library (Books and Binding)	$ 2,000	
5. Herbarium	1,000	
6. Publishing and Printing	3,000	
7. Laboratory apparatus and equipment	2,000	
8. Botanical Exploration; Field Work	2,000	
		10,000
Total Annual Income Needed		$100,000
FOR PERMANENT IMPROVEMENTS:		
9. Nursery, Experimental plot, and Greenhouses	$500,000	
10. Rose garden	10,000	
Total Permanent Improvements		$510,000

Our salary schedule is below that of other similar institutions, a great deal of our work is inadequately manned, and certain activities which are a part of our adopted plan of development are yet to be initiated. The director is prepared to furnish a more detailed statement of these needs to anyone interested.

Additional Land.—The work of the Garden is greatly hampered by lack of an adequate service yard, nursery, and propagating house, and there is no suitable place for one within the present area. A small parcel of land within easy access of the Garden is greatly needed. This need will increase each year, and it will also become annually more and more difficult to meet it. The matter should have immediate attention.

A New Fence.—This need has been stressed in several preceding reports and still remains. Our application to the Board of Estimate and Apportionment for an appropriation of $40,000 of Corporate Stock of the City of New York for a fence to enclose the entire Garden was still pending at the close of the year.

Increased Municipal Appropriation.—The absolute necessity of meeting certain items of maintenance, not provided for in the Tax Budget appropriation but properly chargeable there, has been a heavy drain on our private funds for several years. Relief from this burden is a perennial hope.

Miscellaneous.—Our Loan Collection of Lantern Slides has developed very slowly for lack of funds. The demands for this service increase each year. To provide for the making and coloring of the slides, and for miscellaneous expenses in connection with the service, including the salary of a custodian in charge of our entire collection of lantern slides, negatives, and prints, there is needed an annual income of approximately $5,000.

The need of funds for the following items was set forth *in extenso* in the Twelfth Annual Report (for 1922). They are only enumerated here:

1. Retirement fund.
2. Special horticultural collections.
3. Public lectures.
4. Beautification of the Grounds.

Under the latter head may be mentioned the following specific needs, any one of which might be made the object of a special gift. Most of them would make suitable memorials:

List of Objects Needed for Beautifying the Grounds

1. *The completion of the plaza in front of the Laboratory Building and Conservatories*, including three flights of stone steps, etc.

This work was begun with private funds, amounting to about $12,000, given for that particular purpose. It is estimated that the completion of the work will require a further expenditure of about $16,000, as follows:

a. Three flights of steps and retaining walls	$10,000
b. Underground room for storage of bulbs, etc. (an integral part of the south retaining wall and flight of steps)	6,000
Total	$16,000

2. *Entrance Gateways*, as follows:

a. Eastern Parkway	$15,000–$25,000
b. Flatbush Avenue North Gate	2,500– 5,000
c. Flatbush Avenue Middle Gate	10,000– 15,000
d. Flatbush Avenue South Gate	10,000– 15,000
e. Washington Ave. South Gate	5,000– 10,000
f. Washington Ave. North Gate	10,000– 15,000

These gateways should include stone piers, ornamental iron gates, entrance and exit turnstiles, and, three of them at least, shelter for attendant and counter for placing on sale souvenir post cards, guide books, *Leaflets*, and other objects.

3. *Fountain in Front of Conservatory.* The plan for the conservatory plaza includes a circle in front of the main entrance of the Conservatories, intended for a fountain. Estimated cost, $5,000–$25,000.

4. *Garden Seats.* At least 25–30 are needed. Not merely movable park benches, but seats of artistic merit that will add to the beauty of the Garden. The cost would range from $25 to $50 (for a simple type of seat) to considerably more for a special memorial seat. Estimate for 25 seats at $25–$50 is $625–$1,250.

5. *Bubbler Drinking Fountains.* About 6–8 are needed. Estimate (installed), 6 (at $100–$150) $600–$900.

6. *Upper Rustic Stone Bridge over Brook*	$2,500
7. *Middle Stone Bridge over Brook*	2,000
8. *Lower Stone Bridge over Brook*	2,000

9. *Trellises for Vines, as follows:*

a. Vitis (Grapes)—Arbor over walk, etc.	$500
b. Clematis	100
c. Actinidia. Arbor over walk	500
d. Honeysuckle (*Lonicera*)	200
e. Wistaria	500
f. Akebia	100
g. Moonseed (*Menispermum*)	50
h. Dutchman's Pipe (*Aristolochia*), Shelter and Seat	500
i. Climbing Knotweed (*Polygonum*) (2)	100

Appended Papers

The Reports on Research for 1924, the administrative reports of members of staff, the financial statement, and Appendices 1–7 will be found on the following pages.

Respectfully submitted,

C. STUART GAGER,
Director.

REPORTS ON RESEARCH FOR 1924

Plant Pathology

Investigations with Oat Smuts. By GEORGE M. REED

Specialized Races of Oat Smuts.—The most significant discovery in connection with the investigations of the oat smuts has been the existence of specialized races of both the loose smut (*Ustilago avenae*) and the covered smut (*Ustilago levis*). Some evidence of the existence of such races was obtained in 1923 but the question was finally settled in the experiments during the past year. Two strains of loose smut, one from Missouri and the other from Wales, have been compared. In the main they are similar in their capacity for infecting oat varieties but they show evident differences. Both seem capable of attacking a wide range of varieties of oats. It is also interesting that certain strains of varieties, like Black Mesdag, have proved to be extremely resistant to both races. The two strains of covered smut, one from Missouri and one from Wales, are quite distinct. The Missouri strain is capable of attacking a large number of varieties of oats, belonging to the various species or sub-species of Avena. The Welsh strain, however, seems to be confined almost entirely to certain varieties of *Avena strigosa* and also to a strain of *Avena brevis*. For the most part the same varieties of *A. strigosa* are also susceptible to the Missouri strain. *Avena brevis*, however, has proved to be quite resistant to the latter, although occasional infections have been obtained. A large amount of additional data has been secured bearing upon this problem of physiological specialization. It is, however, a problem which involves the growing of a large number of oat varieties, as well

FIG. 4. Juniper Point, north shore of the lake. May 5. (3730.)

as numerous collections of smuts in order to determine the possible limitations of the different strains.

The Influence of Environal Factors on Oat Smuts.—Previously, studies have been carried out to determine the influence of temperature, moisture, etc. on the infection of oats by the covered smut (*Ustilago levis*). During the past year similar experiments have been carried out to determine the influence of certain environal factors on infection by the loose smut (*Ustilago avenae*). At the same time, the covered smut was also grown for comparison. The temperature and moisture ranges for the loose smut are very similar to those for the covered smut. Infection occurs over a wide range of soil temperatures. The maximum appears to be around 20° C.

Inheritance of Smut Resistance.—Additional progress has been made in the study of smut resistance in certain oat crosses. Very definite results as to the resistance of certain segregates have been secured. The field experiments in general have coincided somewhat closely with the cultures grown in the greenhouse. However, as a rule, lower infections were obtained and the data are not so easily analyzed.

Investigations with Sorghum Smuts. By GEORGE M. REED and JAMES A. FARIS

New Method of Infection in Loose Kernel Smut of Sorghum.—The most important result obtained with sorghum smuts has been the demonstration of a new mode of infection in the loose kernel smut (*Sphacelotheca cruenta*). Heretofore it has been assumed that infection takes place through the young seedling of sorghum by means of spores carried on the seed, or, rarely, in the soil. That such seedling infection does occur has been clearly demonstrated. If the infection occurs in the seedling stage, the host plant is noticeably dwarfed, tillers out extensively, and heads out early. The spores produced in these heads are more or less widely distributed. Some of them may be carried to the young developing heads on lateral branches of normal plants and there give rise to an infection which in a short time may result in the appearance of smutted heads on plants whose terminal head is normal. In some cases, all the flowers in the

head are attacked; in other cases only a few flowers may produce the smut balls. In this new type of infection no general development of mycelium occurs in the host and the pathological symptoms of excessive dwarfing, tillering, early production of infected heads, etc. are lacking. The growth of the mycelium is confined to the individual part—flower, panicle or branch which is invaded. If this branch is removed the plant will continue to produce only sound stems and panicles. This new type of infection bears some resemblances to the localized infection found in the common corn smut (*Ustilago zeae*). In the latter, however, any embryonic tissue of the corn plant may be invaded and the mycelium appears to be strictly local in its cycle of development. There seems to be nothing to correspond to the general systemic infection through the young seedling which occurs in the case of the loose smut of sorghum.

Investigations with Barley and Wheat Smuts. By JAMES A. FARIS

Studies with the covered smut of barley (*Ustilago hordei*), with particular reference to the demonstration of specialized races, were continued. In the earlier studies on the influence of temperature and other factors on infection, considerable evidence as to the existence of such races in this smut was obtained. During the past year their occurrence has been definitely proved and to a considerable extent the host limits of at least five distinct races has been determined. Marked differences occur as to the range of host limitation of these different races. Some varieties of barley prove to be susceptible to two or more races of the parasite, whereas other varieties seem to harbor only their own specific race.

Bunt of Wheat.—A series of experiments with the two smuts which cause the bunt of wheat (*Tilletia laevis* and *T. tritici*) was also carried out. The principal studies were concerned with the environal factors influencing infection. It was found that in general high percentages of infection occurred when the seed was germinated at 5° and 10° C. by both smuts. There was some falling off at 15° C. and a striking decrease in the percentage of infection at 20° C. In some cases the infections were higher at 5° than at 10° and in other experiments the reverse was true.

Both species of *Tilletia* appear to have about the same temperature ranges for infection, although the results apparently indicate that infections with *Tilletia laevis* may be obtained at somewhat higher temperatures than with *T. tritici*. These experiments were carried out with both fall sown and spring sown varieties and there was a fair correspondence between the results. Other factors, as the influence of growth conditions, subsequent to seed germination, the influence of the rate of germination of wheat and the influence of soil moisture were also studied. Preliminary data were secured bearing upon the question as to the existence of specialized races of these two parasites.

Report on Chestnut Bark Disease Investigations. By ARTHUR HARMOUNT GRAVES

As already noted (*Brooklyn Bot. Gard. Rec.* **12**: 40, 1923, and **13**: 27, 1924) certain wild chestnuts in New York City and immediate vicinity show a partial resistance to the bark disease. During the past year, as far as time would permit, the inquiry has been pushed further as to the cause of this resistance. Representative trees at Inwood, Manhattan, at Hollis, Queens, and at Valley Stream, L. I., have been selected, and their bark is now being analyzed under the Direction of Dr. F. P. Veitch, of the Leather and Paper Laboratory, Bureau of Chemistry, U. S. D. A. Bark of similar trees, apparently non-resistant, from West Virginia, collected by Dr. Dow V. Baxter, U. S. D. A., and from Hamden, Connecticut, and North Windham, Maine, collected by the writer, is also being analyzed for comparison in its chemical content with that of the resistant New York trees. From these comparative chemical analyses it is hoped to obtain some light on the cause of the resistance of these remarkable New York trees, some of which are still in good condition and bearing fruit.

For many years it has been observed that apparently healthy basal or coppice shoots develop from the bases of diseased trees or from their cut stumps. These shoots continue their growth sometimes for many years and have attracted such general notice as to have given rise to the popular impression that the chestnut is "coming back." Experiments were begun during

the summer to determine the causes and conditions of this development of shoots, and a careful study of their life history is being made.

In the spring, over 100 scions from the resistant New York trees were secured and sent to the U. S. Dept. of Agriculture for grafting upon Chinese and Japanese chestnut and on various hybrids. This work is being carried on in collaboration with the Laboratory of Forest Pathology, Bureau of Plant Industry, U. S. D. A.

Genetics and Plant Breeding

Investigations on the Laws of Heredity and Variation in Plants.
By ORLAND E. WHITE and DOROTHY I. NEFF

The genetic analysis of peas (*Pisum*).—Investigations on inheritance and variation in several hundred varieties of field and garden peas have been carried on in 1924, as in previous years. These varieties, collected from many different countries, include both wild and domestic types, varieties, and species. Many have very peculiar and little known characters.

Accounts of the genetic investigations of these characters have been published and referred to in previous years. A résumé of all work on the genetics of peas has also been published. Work during the year largely centered on such characters as height, pod-color, pod-shape, foliage color, and certain seed-coat colors and patterns. Data have been accumulated sufficient for several papers during 1925. Insufficient greenhouse facilities, coupled with lack of sufficient trained assistance have greatly impeded the prosecution of this work.

Genetic investigation of hollyhocks.—Studies on heredity and variation in the numerous varieties of the garden hollyhock were begun during 1924. Several hundred flowers were either crossed or selfed. The various types used numbered about thirty, including double, semi-double, and single flower forms. All types were found to be perfectly self-fertile, and in most cases to give plenty of seed when protected from foreign pollen by glassine bags. Good seed was obtained from doubles when selfed. All types so far experimented with readily cross, and their flowers bear considerable mutilation, attendant to removing the anthers, without blasting.

Genetic investigations on yield in corn.—From time to time during the senior writer's connection with the Garden, experiments on certain characters in corn or maize have been carried on. During the past year some very interesting results have been secured regarding the relation of certain crosses to increased yield.

Studies of the Variation of the Boston Fern (Nephrolepis). By R. C. Benedict

Studies of the variation of the Boston fern (*Nephrolepis*) and of other ferns have been continued. The experimental work in the greenhouses and out of doors under lath shade during the summer has required the growing of large numbers of plants. The culture work has consisted in the maintenance of older forms and of testing new forms which have appeared.

A paper was published in the Journal of Heredity giving a survey of the variation of the spore-fertile form of the Boston fern designated as *Nephrolepis exaltata bostoniensis fertilis*. This is the only known fertile form in the whole series of Boston fern varieties. Through the propagation of its spores, begun in 1917, a large number of new and distinct types have been developed. The article in the Journal of Heredity published in the September and October numbers, described the work with these new forms over a period of five years.

During this year a large number of fern plants have been available for transfer to the Department of Elementary Instruction.

Ecology and Plant Geography

By Norman Taylor

The work on the vegetation of Mt. Desert Island, and the factors of the environment which control it, was completed during the year. Field work was carried on by Major Barrington Moore, with whom the Garden is cooperating in this study. The results of our work are now written up, and in condition for publication as Volume III of the Memoirs of the Garden.

Field work was continued on Long Island, especially on the eastern end. During the summer months a temporary laboratory was erected at Montauk for the purpose of studying the

effect of the wind on transpiration, evaporation, and related problems. Considerable time was spent in experiments on cut twigs, phytometers, and Livingston atmometers, with the usual battery of Weather Bureau instruments. A new type of collodion-coated atmometer, devised by Professor Livingston, was tried out at Montauk, and the results sent to the Laboratory of Plant Physiology at the Johns Hopkins University, where, with others, they formed a basis for revising the coefficients which Professor Livingston issues with these instruments.

The results of the study of transpiration as affected by wind, as well as much data on evaporation with relation to wind and fog, are being incorporated in the second part of "The Vegetation of Long Island," on forests, which will be ready for the printer sometime during 1925.

Much work on the "Flora of Long Island" has been accomplished, particularly the checking of old records, the specimens of the Mulford, Hamilton, and Gershoy herbaria, as well as the very valuable and discriminating collections of William C. Ferguson, Esq. of Hempstead, who has cooperated with us most generously.

There are two lines of work which I wish to push actively the coming season.

1. Experimental and field studies of Long Island vegetation—particularly problems to do with succession in the oak-hickory and pitch pine forests.
2. Collect, wherever possible, for the "Flora of Long Island." This record is already more complete than any other, but it is not yet sufficiently complete to warrant publication. I am anxious to gather all the collections possible, within the next two or three years.

Systematic Botany

The Classification of Dicotyledons. By ALFRED GUNDERSEN.

During 1924 I have continued to make observations, drawings and notes on the structure of flowers of dicotyledons. Material is being accumulated for a general outline relating to families of dicotyledons, considering their leading characters in con-

nection with their distribution and probable classification. I have been especially occupied with what appear to be the less specialized forms of certain families and orders and their comparison with plants of families of suspected relationships, particularly in the groups with specialized placentation, the Parietales and Papaverales, with chiefly parietal placentation, and the Centrospermae and Primulales, with chiefly central placentation. Along these lines, a paper on "Comparisons between the Cactaceae and the Aizoaceae" was presented before the Systematic Section of the Botanical Society of America at the Washington meeting.

REPORT OF CURATOR OF PLANTS AND PLANTATIONS FOR 1924

DR. C. STUART GAGER, DIRECTOR.

Sir: The amount of new work accomplished is less than for any previous year in the Garden's history. The following is the record:

1. Seeding down lawn between the museum and reservoir; about one fourth the total area to be seeded.
2. Soil improvement over balance of this area carried forward.
3. Barbed wire fencing erected around Japanese Garden.

There are two reasons why this record is so meagre. Insufficient men is, of course, the chief one. The other has to do with the way which circumstances practically force us to use them. Two men go daily to the gardening force to replace help lost with the graduation of Federal Board students. A third is assigned to the experimental plot, and another to the paths, leaving a daily average of eight men which is not enough to properly maintain the grounds, much less begin new work on any considerable scale.

I should like to call attention to the increasing amount of time spent in tinkering with the fence, wooden steps and bridges. The replacement of these by more permanent structures will release a good deal of time-consuming effort for new work.

FIG. 5. Pelican flower (*Aristolochia grandiflora*) in the Conservatory, April 26. (5026).

Personal Activities

In the spring I was asked by Mr. Robert Moses, of the New York State Association, to go to Montauk and recommend whatever part of the Point seemed to be most suitable for a proposed State Park. In the appropriation proceedings of midsummer, the land, with some slight modifications, which I had indicated on the maps and in my report to Mr. Moses, was taken by the State for the Montauk Park. I have also served in an advisory capacity to Mr. Moses regarding other State Park projects on Long Island.

Respectfully submitted,

NORMAN TAYLOR,
Curator of Plants and Plantations.

REPORT OF THE CURATOR OF PLANTS FOR 1924

DR. C. STUART GAGER, DIRECTOR.

Sir: I submit herewith my report for the year 1924.

Collections

Among plants of special interest added to the collections of living plants last year may be mentioned the Holly Osmanthus (*O. Aquifolium*), Japanese Daphne (*D. Genkwa*), Venus's flytrap (*Dionaea muscipula*), and the Pelican Flower (*Aristolochia grandiflora*).

In accordance with the plan to complete an inventory of the conservatories every three years (1. Special groups, 2. Dicotyledons except Cacti, 3. Monocotyledons), an inventory taken showed the following number of genera and species in the special groups:

Fern Allies: Selaginella 8 species; Equisetum 1 species.
Fern families other than Polypodiaceae: 8 genera, each with 1 species.
Ferns, Polypodiaceae: 30 genera, 110 species.
Cycads: 8 genera, 12 species. We lack only one of the nine genera, namely, *Stangeria*, from South Africa.

Conifers: 8 genera, 14 species.
Gnetaceae: 1 species, *Gnetum Gnemon.*
Cactaceae: 28 genera, 119 species.

Many maps of woody plants in the General Systematic Section (Section I) were revised, in particular the barberries, preparatory to rearrangement.

Labels and Signs

Labels and signs were made as follows:

Steel labels for the beds	423
Family labels for the beds	188
Lead labels for woody plants	275
Lead labels for conservatory	6
Lead labels for rock garden	243
Small wood labels	266
Large wood labels for horticultural forms	12
Wooden signs	48
Cardboard signs	162
Total	1,623

Also numerous other miscellaneous signs.

International Seed Exchange

Correspondence with other botanic gardens regarding greater uniformity of seed lists was continued. A fourth communication, issued in mimeograph form in May and sent to about 100 botanic gardens in all parts of the world, contained an appeal for the formation of an International List of Genera of Plants Cultivated in Botanic Gardens, to be published in the name of many institutions. To make this proposal more definite a preliminary Index of Genera of about 3,000 names as actually used in about 90 seed lists was forwarded. About 2,300 names were listed in capitals; these were the names accepted by *both* the *Genera Siphonogarum* of Dalle Torre and Harms and by the *Index Kewensis;* or for the ferns accepted in Christensen's *Index Filicum.* About 730 names are those as to which there is more or less difference in usage. Final settlement of disputed questions is not sought, but rather a practical compromise especially to simplify the international exchange of seeds. Replies received indicate a favorable attitude on the part of many botanic gardens.

Phanerogamic Herbarium

Among the collections obtained last year were from Dr. O. E. White 542 specimens from Bolivia, collected on the Mulford expedition; from Dr. Robert Cushman Murphy of the American Museum of Natural History, 34 specimens from the South Sea Islands; from Canton Christian College, 106 specimens from China; from Dr. R. R. Stewart, 522 specimens from the Punjab and Kashmir; from the Botanic Garden of Cluj, 104 specimens from Roumania; from Mr. W. E. Broadway, 115 specimens from Trinidad; from Miss Anna Heyward Taylor, 32 specimens from British Guiana; from Dr. R. C. Benedict, 37 specimens from West Virginia.

About 1,800 specimens were mounted and distributed. The cases now allow room for little additional material.

Classes

In the spring I gave four lectures on "The Story of Plant Evolution" at the Brooklyn Botanic Garden, followed by an outdoor course of eight lessons on "Spring Flowers and Ferns." In the fall an outdoor course of six lessons was given on "Fall Flowers and Fruits."

Botanical Society of America

At the meeting of the Systematic Section in Cincinnati, in 1923, a committee (Dr. M. L. Fernald, Dr. H. A. Gleason, and the undersigned, chairman) was appointed "to consider the preparation of a comparative list of generic names in current use for the United States and Canada." A report was submitted at the Washington meeting, December, 1924, showing, in columns, usage in eleven standard works as to a few families. The Section voted to continue the committee with the provision that a member from the West be added.

Assistants

Mrs. Margaret Burdick, now Mrs. F. W. Putz, after ten years of faithful and efficient service resigned in November. She was

married December 1. Mrs. Putz was in charge of plant records at the Garden. Her successor had not been appointed at the close of the year.

Statistics

Plants received during 1924:

From cuttings	6
By collection	12
By exchange	153
By gift or loan	194
By purchase	263
Derived from seed	654
Total	1,282

Plants distributed:

By exchange	298
To members (mostly asters)	1,069
Cuttings	33
Total	1,400

Seeds received:

By collection	115
By exchange	1,136
By gift	28
By purchase	15
Total	1,294

Seeds distributed:

By exchange	4,601

Herbarium specimens received:

By collection	644
By exchange	105
By gift	670
By purchase	840
Total	2,259

Herbarium specimens distributed:

By sale	219
By loan	32
Total	251

Respectfully submitted,

ALFRED GUNDERSEN,

Curator of Plants.

FIG. 6. Public School pupils on arrival to see the motion picture reels on Tea, presented by Sir Thomas Lipton. June 13. (5111.)

REPORT OF THE CURATOR OF PLANT BREEDING AND ECONOMIC PLANTS FOR 1924

DR. C. STUART GAGER, DIRECTOR.

Sir: I beg to submit herewith my report for the year ending December 31, 1924.

In addition to the investigational work on peas, hollyhocks, and corn mentioned in the Reports on Research for 1924 (p. 43), I have continued in charge of the "Ecological Section"—with its various exhibits and demonstrations showing how plants are fitted to cope with their environment. This section has attracted many intelligent, inquiring visitors. Some of the exhibits have made quite striking features, particularly the bed devoted to flowering plants that live on other flowering plants. About half the bed contains hemp plants with several hundred plants of broom-rape (*Orobanche* sp.) growing and living on their roots. These parasites have no green leaves and only their brown flowering stalks with their light purple flowers appear above the ground. As the roots of the hemp plants grow, new seedlings of the *Orobanche* gain a foothold and send up their flowering stalks, so that a continuous series of blooming broom-rapes is to be had. The remainder of this bed is devoted to species of dodder (*Cuscuta*) and their hosts. I have found *Perilla frutescens* Britt. var. *crispa* Deane and the common garden balsam (*Impatiens balsamina* L.) excellent hosts for exhibiting the parasitic nature of dodder, since both are ornamental, easy to grow and both furnish the sort of food to make a fine growth of the dodder. Dodder, being yellow, also shows off well, especially against the purple-bronze leaves of *Perilla*. The yuccas and their silver-winged, blacked-eyed *Pronuba* moths continued to be an interesting and fascinating exhibit, especially to those with some knowledge of the relation of this insect and plant. Another feature of note was a peculiar grape, *Vitis quadrangularis*, from Asia and Africa that much resembles some of the cacti and spurges, owing to its greatly reduced leaves. The absence or reduction of leaf surface, of course, better fits it to cope with arid climates. Much more could be accomplished with this section if more and better trained gardening assistance could be

supplied. Its natural setting makes it one of the show places of the Garden.

Considerable time has also been devoted to plans and accumulations of material looking toward the development of facilities for educational and research work in economic botany at the Garden. This involves lantern slide material for lectures, exhibit material, and living greenhouse and outdoor material.

As for several years past, I have been editor of the Genetics Section of *Botanical Abstracts*, which involves the editing, abstracting, and securing abstracts of several hundred genetic papers and books annually.

Part of my time, during the forepart of the year, was taken up with the preparation of "The Amazon Valley" section of The Naturalist's Guide, a work now in press. This work is to be issued as a guide for naturalists and others, and covers North America, Central America, the West Indies, and northern South America.

Numerous inquiries regarding heredity, plant-breeding, economic plants, and South America were answered.

Respectfully submitted,

ORLAND E. WHITE,

Curator of Plant Breeding and Economic Plants.

REPORT OF THE HORTICULTURIST AND HEAD GARDENER FOR 1924

DR. C. STUART GAGER, DIRECTOR.

Sir: I beg to submit herewith my report for the year ending December 31, 1924.

The gardening force consisted of six gardeners. Half the time of one man was assigned to the Curator of Elementary Instruction and half the time of one man to the Curator of Plant Pathology. During the growing season two men from the laboring force were available for gardening work. With the increase of the scientific collections and of the horticultural features of the garden the services of two additional gardeners are urgently needed.

FIG. 7. Class from Public School studying trees in their winter condition. The instructor is using the megaphone. Feb. 4. (5249.)

In addition to routine maintenance, gardening work was as follows:

Rock Garden

The rock garden was extended 60 feet southward on the east side of the main walk to correspond with existing planting on the west. In the spring of 1925 this area will be planted and screen planting installed to balance that on the west side. Many choice alpine and saxatile plants have been added to the rock garden collection during 1924, notably some rare western plants derived by exchange with Mr. Clarence Lown.

Bulb Planting

Nearly 28,000 bulbs were planted during the fall, distributed as follows:

7,000 Crocuses, white, striped, and yellow, extending the existing planting north of the Flatbush Avenue service gate.

5,000 *Narcissus poeticus ornatus* (Poet's Narcissus) added to the existing group amongst the Walnut family.

3,000 *Eranthis hyemalis* (Winter Aconite) south of the boulder bridge to correspond with existing group north of the bridge.

1,000 *Galanthus Elwesii* (Giant Snowdrop) added to the existing planting near the Barberry family.

4,000 *Tulipa gesneriana major*—

2,750 *Tulipa gesneriana lutea*, near the *Robinia* collection.

3,000 *Narcissus incomparabilis* var. "Sir Watkin," on the hill opposite the Laboratory Building.

1,675 Tulips in over sixty species and varieties in two beds in the Monocotyledon area. More than half of these tulips were American grown bulbs donated by the Seabrook Company.

360 Irises of bulbous types in two new beds west of the brook on either side of the walk leading from the Laboratory Building.

Miscellaneous Planting

A rearrangement and replanting of the beds of the Campanulales Order was effected—the work of making new beds being carried out with the help of the laboring force. The additional beds in this area will give room for a collection of horticultural varieties of *Dahlia* and *Chrysanthemum* and allow us to extend the collection of garden forms of perennial asters.

Apart from additions to the systematic collections, the following plantings were made: 116 trees in the wild flower section, 100 Ginkgo trees on the Museum embankment, numerous plants of the Prairie Rose, *Rosa setigera*, back of the Azaleas near the Malbone Street entrance, and 100 Red Bud, *Crecis canadensis*, on the border mound west of the Walnut family. About 50 roses (Paul's Scarlet Climber) were planted on the trellis on the east side of the children's garden to replace unsatisfactory seedling forms, and 147 feet of stepping stone walk was constructed in the children's formal garden.

International Seed Exchange

During 1924 seeds of nearly 1,000 species and varieties of plants were collected in the Garden. With the addition of seeds collected elsewhere by Dr. Gundersen and others, this admitted of the inclusion in the Exchange Seed List of 890 names of plants of which seeds were available for distribution. The collection, cleaning, filing, and distribution of seeds in this connection consumes a great deal of time. Its value to the Garden, however, for many reasons, apart from the opportunities it offers of adding rare plants to our collections through exchange with other Botanic Gardens, is such that it should be considered an indispensable part of our activities. The distribution of seeds the past year to various countries is shown below:

Country	No. of Institutions	No. of Packets	Country	No. of Institutions	No. of Packets
Austria	2	71	Japan	1	89
Belgium	3	45	Jugoslavia	1	25
Bulgaria	1	72	Mexico	1	20
Canada	2	65	Norway	1	43
Czechoslovakia	3	312	Portugal	1	42
Denmark	1	40	Poland	3	118
Esthonia	1	69	Roumania	3	384
France	14	539	Russia	2	129
Great Britain	5	187	South Africa	1	108
Germany	20	970	Spain	1	46
Holland	7	192	Sweden	4	172
Hungary	1	89	Switzerland	4	167
Irish Free State	2	60	United States	5	257
Italy	5	126	Uruguay	1	47
			Total		4,484

Educational Work.—In addition to various outside lectures, I conducted two public courses at the Botanic Garden, viz.: Plants in the Home, and Gardening in the Fall. Numerous questions concerning gardening matters have been answered orally or by letter.

Respectfully submitted,
MONTAGUE FREE,
Horticulturist and Head Gardener.

REPORT ON THE CRYPTOGAMIC HERBARIUM

DR. C. STUART GAGER, DIRECTOR.

Sir: The report on the Cryptogamic Herbarium for the year 1924 is as follows:

ACCESSIONS TO THE CRYPTOGAMIC HERBARIUM, 1924

Date	No. of Spec.	From	How Acquired	Remarks
		Fungi		
Feb. 10..	5	David Griffiths	Gift	——
" —..	200	E. Bartholomew	Purchase	N. A. Ured. Cent. 30–31
Aug. —..	200	H. Sydow	Purchase	Mycotheca Germanica Fasc. 42–45
" —..	100	Ed. Fischer	Exchange	——
" —..	7	Botanic Garden, Cluj, Roumania	Exchange	——
Dec. 19..	26	J. F. Brenckle	Purchase	Fungi Dakotenses Fasc. 23
" —..	108	C. R. Hursh	Purchase	——
" —..	6	Dr. L. Hecke	Gift	——
" —..	13	Local Collections	Collection	——
Total..	665			
		Mosses and Lichens		
Mar. 27..	15	Norman Taylor	Collection	Coll. at Mt. Desert Island, Maine
Sept. 6..	25	John Holzinger	Purchase	From Western U. S.
" 13..	4	Botanic Garden, Cluj, Roumania.	Exchange	——
Total..	44			

Respectfully submitted,
GEORGE M. REED,
Curator of Plant Pathology.

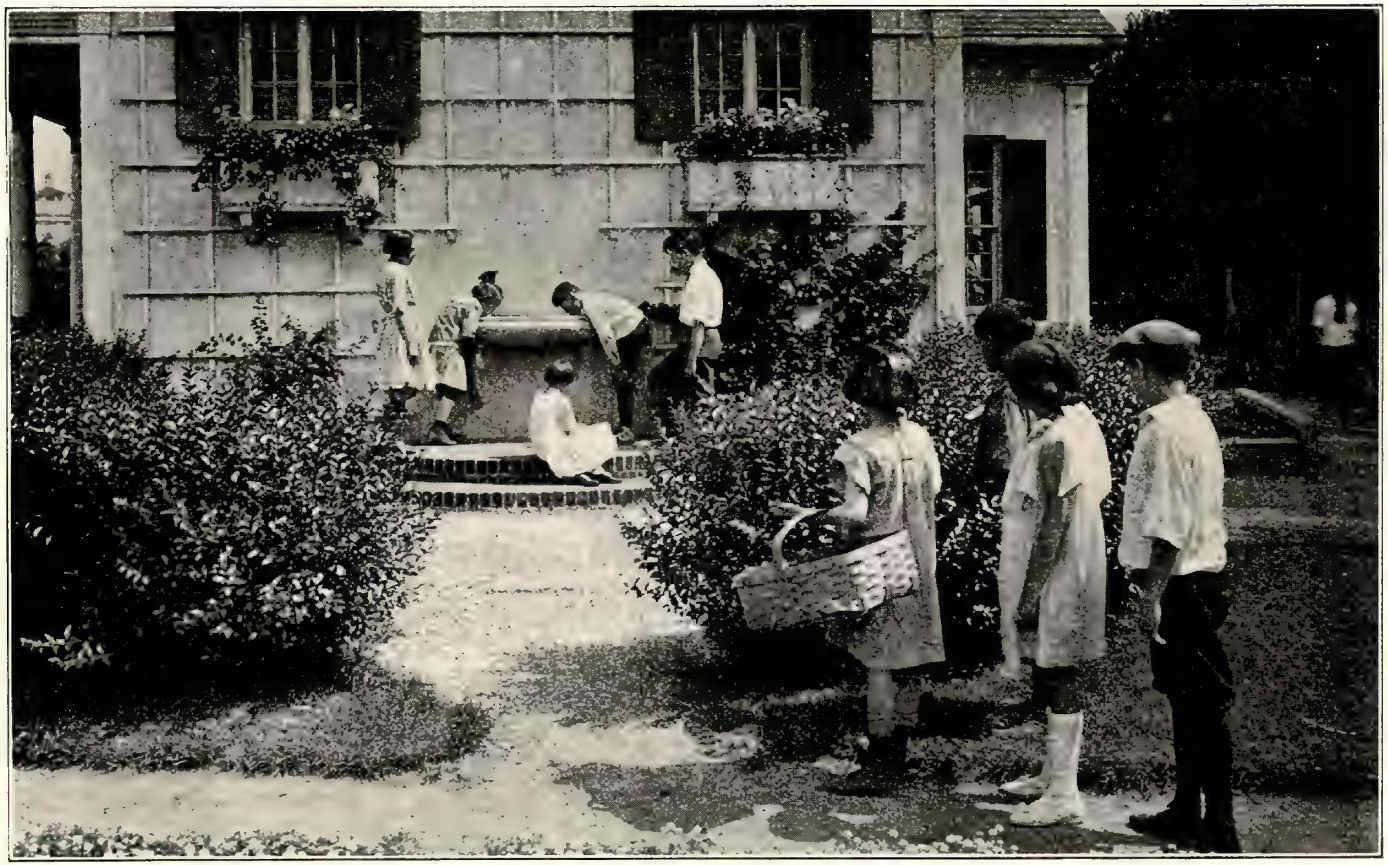


FIG. 8. Pupils in children's garden class drinking at the bubbler fountain on the north wall of the Children's Building. July 17. (4583.)

REPORT OF THE CURATOR OF PUBLIC INSTRUCTION FOR 1924

DR. C. STUART GAGER, DIRECTOR.

Sir: I beg to submit herewith my report for the year ending December 31, 1924:

Public Lectures

Public lectures at the Botanic Garden were given in 1924 as follows:

1. April 13.—Scenic Wonders of the Northwest. Mr. LeRoy Jeffers, F.R.G.S.

2. April 27.—The Trees of Greater New York. Dr. Arthur Harmount Graves, Curator of Public Instruction, Brooklyn Botanic Garden.

3. May 4.—Useful Tropical Plants. Dr. Orland E. White, Curator of Plant Breeding and of Economic Plants, Brooklyn Botanic Garden.

4. May 18.—Rock Gardens. Mr. Montague Free, Horticulturist, Brooklyn Botanic Garden.

5. June 1.—Irises. Dr. George M. Reed, Curator of Plant Pathology, Brooklyn Botanic Garden.

6. September 21.—Asters and Other Herbaceous Perennials. Mr. H. E. Downer, Horticulturist, Vassar College.

7. September 28.—Water Lilies. Mr. Charles L. Tricker, Horticulturist.

8. October 5.—Cannas. Mr. Louis Wintzer, of the Conard and Jones Company (now Conard-Pyle Co.).

9. November 3.—The Effect of Electricity on the Growth of Plants. Professor V. H. Blackman, University of London.

Lectures 4–8 inclusive were devoted to special plant groups in bloom in the Garden at the time of the lecture. In each case a short talk in the lecture hall was followed by a visit to the plants in flower in the Garden, where the lecturer demonstrated the points discussed in his lecture, and answered questions regarding culture, etc.

Boy Scout Exhibit

From May 4 to May 11 an exhibition of scoutcraft models was held in the Exhibit Room of the Laboratory Building. These models were made by Brooklyn Boy Scouts and showed that Boy Scouts by no means spend all their spare time hiking about the country. The articles exhibited included paper knives made of rare native woods, bird houses, bridge models, tabourets, knot boards (illustrating many types of knots tied with cord and rope), camp scenes, and collections of nature material. The attendance at the exhibit was about 600.

Study Material for Educational Institutions

The rapidly increasing popularity of this branch of our service is particularly gratifying. During 1924 Miss Charlotte S. Young has continued in charge of this work, which now occupies nearly all her time. During 1924 we received from high schools, academies, colleges, and other educational institutions (mainly in Brooklyn, but some also from other boroughs), 143 requests for plant material of all kinds to supplement and enrich text-book studies. This is a large increase over last year, 110, and over the year before, 48. Eleven hundred eighty petri dishes with sterile nutrient agar have been sent out for the study of molds, bacteria, etc., in the schools. This is nearly twice last year's number, 664, and over three times the number sent out in 1922, 358. During 1924, 161,450 pupils used study material of one sort or another, furnished by us. A tabular outline illustrates the growth of this service more clearly:

Year	Requests for Material	Petri Dishes Filled	Number of Pupils Reached
1922....	48	358	5,398
1923....	110	664	24,348
1924....	146	1,180	161,450

Two sets of lantern slides on Forestry, beautifully colored by Miss Alice T. Searle, have been added to our loan series. These have been carefully selected from samples kindly furnished us by the United States Forest Service. Appropriate texts have

been written to accompany these slides. Another set on Conservation has been planned, but no money for the slides is available. A fund is needed for the purchase of these loan slides, which of course when once obtained are an asset of permanent educational value to the city. A small greenhouse is also urgently needed where plants (seedlings, algae, ferns, etc.) used by the schools could be grown.

Classes and Attendance

The total attendance for 1924 at all classes and lectures was 104,587, a slight increase over last year's figures, 99,259. The registration at the gates, 438,091, shows a healthy increase over 1923, which was 408,520. The following table shows the attendance and registration in 1924:

TABLE I

ATTENDANCE AT THE GARDEN DURING 1924

	Jan.	Feb.	Mar.	Apr.	May	June	July
At regular classes	732	1,216	1,525	1,923	2,270	2,527	5,500
At visiting classes	577	390	2,021	6,704	8,388	5,812	312
At lectures to children	330	230	1,375	2,775	2,678	1,711	106
At lectures to adults	20	0	12	384	526	156	6
At conservatories	899	1,143	2,317	2,371	3,779	2,959	1,857
Total registration at gates	17,610	14,955	26,299	39,700	73,734	56,375	43,579

	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Totals
At regular classes	3,600	2,919	3,466	2,700	3,298	31,684
At visiting classes	300	300	10,977	9,814	4,288	49,883
At lectures to children	100	125	3,411	4,970	3,035	20,846
At lectures to adults	0	89	915	66	0	2,174
At conservatories	815	2,869	3,058	1,858	813	24,738
Total registration at gates	45,520	45,511	53,906	27,962	15,195	438,091

Personal Classwork

I have conducted a course entitled General Botany, for teachers of nature study, biology and for others interested. In the spring I offered a course for the public on the Trees and Shrubs of Brooklyn and vicinity in which 60 people were enrolled; in the fall 58 people registered for a similar course.

As special examiner appointed by the Brooklyn Council of Boy Scouts I have given several tests to candidates for merit badges in Agriculture, Conservation, Forestry, Botany, and Gardening. In addition I have had two special classes of young boys, one from the Boys' High School, and one from P. S. 147, for instruction in the identification of woody plants.

Editorial Work and Other Activities

I have continued to serve on the Editorial Board of the *American Journal of Botany*, as well as acting as Assistant Editor of the Botanical Education Section of *Botanical Abstracts*. I have also edited the 1924 series of Brooklyn Botanic Garden *Leaflets*, consisting of 10 numbers. In January, 1924, I was elected Secretary of the Torrey Botanical Club.

Publicity

The weekly bulletin of happenings at the Garden entitled "Brooklyn Botanic Garden Notes" has been continued through 1924, more than 100 typewritten pages having been issued to about 25 newspapers and other news-distributing agencies, including the metropolitan dailies and several Long Island papers. It is gratifying to receive reports from various parts of the country and from foreign countries, showing that these articles are widely read and to feel that this part of our work is helping the Garden to become better known each year.

On July 24 the newspaper, *Amrita Bazar Patrika*, of Calcutta, India, published a quotation from the *American Review of Reviews* concerning the floating fern (*Azolla*) growing on the surface of the water in the brook and terminal pool at the Garden. The Brooklyn edition of the New York *American* carries daily announcements of all events at the Garden. The Norwegian weekly (*Nordiske Tidende*) (Norwegian Times) for April 24 and later issues had prominent articles on the Brooklyn Botanic Garden (*Brooklyn's Botaniske Have*), and the April 26 issue of *Brooklyn*, the weekly official organ of the Brooklyn Chamber of Commerce, carried an instructive illustrated article of nearly two pages on the Garden, written by Miss Marguerite A. Salomon, of the Chamber of Commerce.

Scientific Investigation

The study of diseases of forest trees, the field of research in which I am particularly interested, has not progressed rapidly because curatorial duties of an educational or editorial nature have made increasingly heavy demands on my time. Some advance has been made, however, in the study of the chestnut bark disease, as outlined in the Report on Investigations (p. 42).

Respectfully submitted,

ARTHUR HARMOUNT GRAVES,
Curator of Public Instruction.

REPORT OF THE CURATOR OF ELEMENTARY INSTRUCTION FOR 1924

DR. C. STUART GAGER, DIRECTOR.

Sir: I hereby present to you the twelfth annual report from the Department of Elementary Instruction.

Educational Work

a. Visiting Classes.—Two experiments have been tried out during the fall of 1924 with visiting classes. The first had to do with the problem of the large school-group. Heretofore it has been our policy to encourage schools in sending small groups of children to the Botanic Garden in order that the work may be of a personal and lasting quality. For some time we have faced the fact that we must somewhat change this policy to meet the request of the schools to send larger groups. To meet this demand we have tried outdoor instruction by means of the megaphone. This solution of the problem was made by Miss Mabel Turner who came to us after the resignation in September of Mrs. Weber (formerly Miss Edith Sanders). Miss Turner has found it possible in this way to conduct a class of 300 children and put over the educational work, whether it be in the nature of a general inspection "walk and talk" about the Garden, or a special lesson such as "The Study of Trees and Their Fall Aspects." This method proved to be a very satisfactory one both to us and to the teachers and children. It practically solves the problem above stated.

FIG. 9. Scene in the Children's Garden, June 1. This is near the center of a city of over 2,000,000 population. Not a bad substitute for a vacation in the country. (5107.)

The second experiment dealt also with the teaching of groups outdoors, but in this case each child was given a mimeographed sheet upon which was tabulated the lesson of the day and points to be studied were suggested. Following the lesson was a series of questions which was worked out to stimulate interest and to clinch points in the lesson. By this method the child did practically all of the work. The reaction from teachers and pupils to this second educational experiment in teaching was most satisfying and flattering.

The attendance at lectures to visiting classes has increased about 20 per cent. over the lecture attendance of last year.

I should like to bring to notice here three particularly delightful experiences with visiting classes. On May 22d, P. S. 36 sent the entire upper school to celebrate Lilac Day. After a talk in the auditorium on "Down to Kew in Lilac Time," by Mr. Montague Free, and the singing of "Lilac Time" by the boys and girls, a pilgrimage was made to the lilac triangle. In early June the Maxwell Training School for Teachers sent 200 students here to listen to a talk on the educational opportunities offered to teachers at the Brooklyn Botanic Garden. This lecture was given by the Curator of Elementary Instruction, and after that, the young teachers-to-be were taken about the grounds to learn for themselves the possibilities. In the spring we received a gift of two moving-picture reels on "Tea." These were presented by Sir Thomas Lipton of London. On June 13, the first showing of the reels was given to groups of children selected from thirteen of our elementary schools, at which time a letter of thanks was dictated by the children to be sent to Sir Thomas Lipton, and to which a reply of appreciation was received on September 12. These reels have been shown since that time before a number of groups of visiting classes and are a valuable asset to the Department's film collection. I would call to your attention also one striking result or reaction from the work given to visiting classes. Some years ago a group of boys and girls was sent to the Brooklyn Botanic Garden from P. S. 36 to learn how to pot bulbs. That group, returning to the school, taught the children in the entire school how to pot bulbs. This fall the Curator was invited to go to P. S. 36 and see the result of this work after five years had elapsed since the initial lesson. A picture given with

my report shows the children potting up bulbs out in the areaway between the two buildings of P. S. 36. On close observation, one may note slips of paper in the hands of the pupils. These papers have upon them the directions for the potting of bulbs which in substance were the directions given to those children who came five years ago to receive the lesson on bulb planting.

b. Saturday Classes.—The Saturday fall classes for boys and girls have been interesting and stimulating. The Saturday before Christmas the children's annual Christmas party was given. This was an unusually festive party, due to the kindness of Dr. and Mrs. Glentworth R. Butler, who presented the children with their ice cream and cake. Mrs. Orland E. White told some Christmas stories and, after that, special gifts were presented by the children to Mrs. Glentworth R. Butler, Mrs. James H. Post, Dr. C. Stuart Gager, and the Curator of Elementary Instruction.

Boys' and Girls' Club Room

I must report here the progress made in the work on the boys' and girls' club room. The work has been completed. The two floral panels, painted in oil by Miss Elizabeth Tyler, were finished, framed, and hung for the annual inspection; also the pictures—those of nature lovers, chosen as specially appropriate, namely; Jean Favre, John Burroughs, and Mrs. Anna Botsford Comstock. The picture of Mrs. George D. Pratt, founder of this room, was framed and placed; also a picture of Mr. Alfred T. White, the children's dear friend and benefactor. New furniture has been added, and the transparencies placed, so that this room, at Spring Inspection time, was practically a completed unit. A number of additions have been made by gifts to the children's library during the year.

The Outdoor Garden

Improvements have been made in the children's outdoor garden. Stepping stones were placed in the formal garden, a new brick walk laid, 600 bulbs planted in the flower garden, and a new perennial border established at the south of the children's house. Several pleasant and informal little parties

were given in the flower garden during the summer. These parties were organized by the children; the final one given on October 11, in honor of Mrs. Glentworth R. Butler. At this time the children presented Mrs. Butler with one of their own Club pins. Right here it seems a suitable place to acknowledge the many kindnesses of Mrs. Butler and the interest she has shown in the children's work. Through her instrumentality a number of gifts have come to us. The last of these was in the form of money to be used for furniture for the children's garden house. This gift was presented by Mrs. James H. Post through Mrs. Butler.

Seed Work

The distribution of packets of seed to children for planting in school and home gardens this past year has been a great success. Over 200,000 packets were sold. More equipment has been added to the seed-room, and the work of systematizing this department, initiated by Mrs. Leroy Young (née Edna Burtis), has been carried on by Miss Maude L. Hickok to a greater efficiency.

Children's Annual Garden Exhibit

The children's Garden Exhibit was held in September as usual. The judges were Mr. Van Evrie Kilpatrick, Director of Nature-Garden Work for New York City, Mr. James J. Reynolds, District Superintendent, and Mr. Gordon Utter, an old student of the Botanic Garden. In October the prizes were given out by the Director of the Garden, while the special prizes were presented by the donors. These prizes this year were as follows: a cup for the boy doing the best garden work presented by the President of the Garden Teachers' Association; a cup for the girl doing the best work presented by Mrs. Glentworth R. Butler; two books presented by Mrs. Eva L. Carson for the Flatbush Garden League to the boy and girl—first year students —who had made the most progress in garden work, and three gold honor pins presented by the Curator of Elementary Instruction.

Special Features

On April 16, the Junior League met at the Garden through an invitation extended by Mrs. Butler and real interest was shown

in the work of the organization. In late spring the Curator spoke at a meeting of the Columbia Dames, an organization composed of the wives and mothers of graduate resident students at Columbia University. In October this organization met at the Brooklyn Botanic Garden, and presented and planted two rosebushes. These bushes were placed at the gate on the north side of the children's garden house. The Brooklyn Girl Scouts asked the Brooklyn Botanic Garden to take over some of the second class Scout work so that at the present time all second class tests in tree and plant study are given at the Garden. Tests are given on the second Friday evening and second Saturday morning in each month. The Curator of Elementary Instruction was asked to submit to the Woodcraft League some suggestions for their nature study coups in gardening, and this organization has also asked the privilege of having its nature study collections in plant and tree work checked up at the Brooklyn Botanic Garden.

Mr. Van Evrie Kilpatrick, Director of Nature-Garden Work, New York City, gave a spring lecture in our auditorium on "Classroom Projects." This was largely attended. The Assistant Curator, Miss Elsie Hammond, gave a series of three spring nature talks and demonstrations. This series was one of the most popular and well-attended of any series ever given for teachers at our institution.

During the month of January, Miss Zelda Sargent, Assistant Supervisor of Nature Study and Gardening from Springfield, Massachusetts, studied with us.

An arrangement has been made with New York University by which that institution will accept the courses given for teachers at the Brooklyn Botanic Garden to count for college credits.

Personal Activities

In the year of 1924 I have spoken both at the Garden to outside organizations, and away from the Garden to similar organizations, nearly fifty times, and at approximately 500 sessions of visiting classes, including those lectures given to motion-picture groups.

The plant stories written by the Curator for the Junior Home Magazine have continued throughout this year and there have

been two requests from different publishers for a book of similar stories for children. In addition to this I still act as secretary for the National Plant, Flower and Fruit Guild.

Summary

In 1924 the seed work has increased greatly: many improvements have been made in the work of the outdoor garden; lecture periods to visiting classes have increased, attendance remaining approximately the same; the number of sessions of regular classes has increased; also the number of conference periods with teachers.

FIG. 10. Lesson in bulb planting at Public School 36. This lesson was first given to a visiting class from this school at the Botanic Garden about five years before. The method is handed down from year to year, and thus the work "goes marching on." Nov. 19. (5226.)

The need for exhibit cases is very evident; more motion-picture films should be added, and more colored lantern slides to complete sets. I would emphasize again, as I have before in reports, the need of an auto bus for transporting students from schools, and a small motor car for the delivery of seed orders to schools.

A seed-filling machine would simplify the work of seed filling and make possible a larger output of work.

Respectfully submitted,

ELLEN EDDY SHAW,
Curator of Elementary Instruction.

REPORT OF THE LIBRARIAN FOR 1924

DR. C. STUART GAGER, DIRECTOR.

Sir: I have the honor to submit herewith my report as librarian for the year ending December 31, 1924.

The principal piece of work completed during the year, aside from the daily routine, has been the cataloging of the two foreign orders received some years ago, as well as some smaller collections donated by several institutions.

Accessions

The library received 551 volumes, 536 pamphlets and 6,195 parts of publications. The figure for the volumes acquired during the year would have been appreciably larger had there been funds available for binding, as the volumes formed by binding serials would have been included in this count.

Part of the income from the Benjamin Stuart Gager Memorial Fund, as usual, has been used in the purchase of sets. The following acquisitions have materially helped to extend or complete sets of periodicals and serials:

Annales Mycologici, volumes 1–10; *Bibliotheca Botanica*, 1886–1921; *Le Botaniste*, volumes 1–15; *Recueil de L'Institut Botanique Léo Errera*, volumes 1–10; *Transactions and Proceedings of the Edinburgh Botanical Society*, volumes 1–27; *Journal of the Royal Horticultural Society*, London, volumes 23–38; *Transactions of the Linnean Society of London*, volumes 1–30; *Revue Mycologique*, volumes 1–28; *Revue de L'Horticulture Belge et Étrangère*, volumes 1–40, and the *Bulletin de la Société Botanique de France*, second series, volumes 30–63.

The Benjamin Stuart Gager Memorial Fund has also enabled us to secure another title to be added to our small group of

incunabula, *Herbarius Zu Teutsch*, Augsburg, Johann Schonsperger, 1488. This is another edition of the *Ortus Sanitatis*.

Of rare volumes belonging to early printed books, which were either purchased with this same fund, or donated, are Crescenzi, *De Agricultura*, 1504; Brunfels, *Onomastikon Medicinae*, 1534; Egenolph, *Herbarum Imagines Vivae*, 1535; Mattioli, *Di Pedacio*, 1544; Theophrastus, *De Historia Plantarum*, 1552; Colonna, *Phytobasanos sive Plantarum Aliquot Historia*, 1592; Bacon, *Sylva Sylvarum*, 1627; Albertus de Bollstaedt, *Albertus Magnus de Secretis Mulierum*, 1669.

Periodicals, Serials, Documents

Of the 802 periodical titles received, 645 are exchanges, 75 subscriptions and 71 gifts. The more important of the new titles are listed below:

Acta Forestalia Fennica (Society of Forestry in Finland); *Bibliotheca Genetica; The Yearbook of the Planters' Association of Ceylon; Bulletin, Natural History Survey, Chicago Academy of Sciences; Boletin Sociedad Nacional de Agricultura, Chile; Bulletin, Connecticut Agricultural Experiment Station, Tobacco Sub-station; Bulletin, Department of Agriculture, Federated Malay States; Bulletin, Georgia Coastal Plain Experiment Station; Bulletin* (Botanical series), *Hawaiian Sugar Planters' Association Experiment Station; Memoirs* (Bacteriological series), *Department of Agriculture in India; Bulletin, Iowa State Parks; Royal Botanic Society of London, Annual Report of the Council; Memorias* and *Boletin de la R. Sociedad Española de Historia Natural; Bulletin, Maine Forest Service; Publication, Marsh Botanical Garden of Yale University; Nature; Circular* and *Professional Paper, New Zealand State Forest Service; Arboretum Amazonicum, Museu Goeldi; Mémoires de la Faculté des Sciences de L'Université de Lithuanie; Studies from the Plant Physiological Laboratory of Charles University, Prague; Preslia, Reports of the Czechoslovak Botanical Society of Prague; Annual Report* and *Bulletins, Queensland Bureau of Sugar Experiment Stations; Recueil de L'Institut Botanique Léo Errera; Boletim, do Museo Nacional do Rio de Janeiro; Bulletin of Applied Botany and Plant Breeding, Petrograd; Travaux de la Section de Mycologie et de Phytopathologie de la*

Société botanique de Russie; Revista de Agricultura Tropical, Salvador; Proceedings, Agricultural Society of Trinidad and Tobago; Tropical Agriculturist, Peradeniya, Ceylon; Verhandlungen der Zoologisch-Botanischen Gesellschaft, Wien.

Inter-Library Loans

The annual loan of books was made to the Biological Laboratory, Cold Spring Harbor, for the summer session. Twenty-six volumes were loaned during the year to the Carnegie Institution of Washington, Department of Genetics, Cold Spring Harbor; Columbia University; American Museum of Natural History, and the Carnegie Library of Pittsburgh.

Thirty-three publications were borrowed for the use of the staff from the American Geographical Society, American Museum of Natural History, Brooklyn Museum, Brooklyn Public Library, Library of U. S. Department of Agriculture, and the Library of Congress.

Miscellaneous

The sales from the Griffiths' Collection this year amounted to $121.55.

Over 900 volumes are now shelved in the Overflow Collection in the lower stack room for lack of shelf space in the library.

There were donated to the Boyce Thompson Institute for Plant Research, Inc., 136 publications from our duplicate collection.

The Library was represented at the New York Library Club, the Conference of Eastern College Librarians, the Special Library Association, and the New York Regional Group of Cataloguers. The librarian was made a member of the 1924 Program Committee of the New York Regional Group of Cataloguers.

The Junior Class, consisting of 40 students of the Library School of the New York Public Library, made their annual visit to the Garden on May 23d. After a talk by the librarian on library methods and on the work of the library, tea was served, and Dr. Graves outlined the various activities of the Garden. The class was then conducted over the grounds by Dr. Graves and Miss Young.

The Boys' and Girls' Club Room Collection, numbering at present 143 volumes, and the N. Y. Botanical Garden purchase, consisting of 57 volumes, plus a few parts and pamphlets, are still to be catalogued.

I should add that the library could not possibly have accomplished the amount of work it did, with the changes in the staff during the year, had it not been for the trained assistant (Mrs. Marion Rust Trilling) we were fortunate in securing for the few months over the summer.

In summarizing the work of the year I have not mentioned certain kinds of work which necessarily must go on if the physical up-keep of the library is to be preserved. For instance, 217 black letter labels for the agricultural experiment station stacks were made during the year and almost 200 others for various shelves and files. Over 200 old packages of publications were rewrapped. About 300 volumes were moved to the Overflow Collection, and dummies, of course, were made for each title removed from the regular shelves.

For list of donors and gifts, see Appendix I.

The statistical report follows:

STATISTICAL REPORT ON THE LIBRARY

Accessions

	Volumes	Pamphlets	Parts (Including Periodicals)
Exchange	113	187	3,808
Gift	50	168	1,331
Publication	3	118	330
Purchase	384	63	719
Bindery	1	0	0
Deposit	0	0	7
Total	551	536	6,195

Total number of parts of publications added to library during 1924, including current periodicals	6,195
Total number of volumes in library, December 31, 1923	9,864
Number of volumes added during 1924	551
	10,415

Minus volume transferred	1
Total number of volumes in library, December 31, 1924	10,414
Total number of pamphlets in library, December 31, 1923	6,624
Total number of pamphlets added during 1924	536
Total number of pamphlets in library, December 31, 1924	7,160
Total number of volumes and pamphlets in library, December 31, 1923	16,488
Total number of volumes and pamphlets added during 1924	1,087
	17,575
Minus volume transferred	1
Total number of volumes and pamphlets in library, December 31, 1924	17,574

Serials, Periodicals and Documents

No title has been included in this list unless a number has been received during 1924.

Subscription	75
Gift	71
Exchange	645
Deposit from Brooklyn Public Library	2
Publication	9
Total	802
Increase	93

Cataloguing

Volumes entered in accession book	551
Books, Pamphlets, Serials catalogued	2,629
Duplicates catalogued	977
Catalogue cards typewritten	2,140
Shelf list cards typewritten	720
Pamphlet cards typewritten	700
Current periodical cards typewritten	104
Cards for catalogue of duplicates typewritten	168
New typewritten cards revised and filed	3,832
Torrey Botanical Club index cards on file, December 31, 1923	32,114
Filed during 1924	1,068

Total number of Torrey Botanical Club index cards on file, December 31, 1924	33,182
Index Algarum Universalis cards, December 31, 1923	15,604
Cards received during 1924	0
Total number of printed cards filed during 1924	1,068

Miscellaneous

Attendance in library, approximately	10,398
Books loaned to members of staff	2,208
Books loaned to other institutions	26
Books borrowed from other institutions	33

Respectfully submitted,

RAY SIMPSON,
Librarian.

FINANCIAL STATEMENT FOR 1924

I. Tax Budget Accounts

1360 *Personal Service:*

Appropriation	$75,916.08
Expended	75,916.08

1361 *Other Codes than Personal Service:*

Line 1 Fuel Supplies:

Appropriation	$ 2,500.00	
Supplemental Account—Special Revenue Bonds R.D.P. 215-F	1,300.00	
Transferred from Line 11—Light, Heat and Power	40.37	$ 3,840.37
Expended		3,840.37

Line 2 Office Supplies:

Appropriation	$ 300.00
Expended	300.00

Line 3 Laundry, Cleaning and Disinfecting Supplies:

Appropriation	$ 30.00
Expended	30.00

Line 4 Botanical and Agricultural Supplies:

Appropriation	$ 1,000.00
Expended	1,000.00

Line 5	General Plant Supplies:		
	Appropriation		$ 250.00
	Expended		250.00
Line 6	Wearing Apparel:		
	Appropriation		$ 39.00
	Expended		39.00
Line 7	Office Equipment:		
	Appropriation		$ 200.00
	Expended		200.00
Line 8	General Plant Equipment:		
	Appropriation		$ 1,200.00
	Expended		1,200.00
Line 9	General Plant Materials:		
	Appropriation		$ 1,100.00
	Expended		1,100.00
Line 10	General Repairs and Replacements:		
	Appropriation		$ 1,350.00
	Expended		1,350.00
Line 11	Light, Heat and Power:		
	Appropriation		$ 500.00
	Expended	$ 459.63	
	Transferred to Line 1—Fuel Supplies	40.37	500.00
Line 12	General Plant Service:		
	Appropriation		$ 500.00
	Expended		500.00
Line 13	Hire of Horses and Vehicles with Drivers:		
	Appropriation		$ 500.00
	Expended		500.00
Line 14	Telephone Service:		
	Appropriation		$ 275.00
	Expended		275.00
Line 15	Carfares:		
	Appropriation		$ 50.00
	Expended		50.00
Line 16	Express and Deliveries:		
	Appropriation		$ 200.00
	Expended		200.00

Line 17 Contingencies:

Appropriation		$ 100.00
Expended		100.00

Summary of Tax Budget Accounts:

Appropriated by City for Maintenance	$87,310.08
Expended	87,310.08

II. Private Funds Accounts

1. *Endowment Fund* ($50,500.00). *Restricted in part:*

Income Account:		
Income 1924		$ 3,808.73
Transferred to Special Contributions		3,808.73
		$ 0.00

2. *Life Membership Fund* ($5,000.00). *Restricted:*

Income Account:		
Income 1924		$ 275.00
Transferred to Endowment Increment Fund	$ 55.00	
Transferred to Tuition and Sales Instruction	220.00	275.00
		$ 0.00

3. *George C. Brackett Library Fund* ($500.00). *Restricted:*

Income Account:		
Balance, January 1, 1924		$ 21.27
Income 1924		27.48
		$ 48.75
Expended	$ 16.82	
Transferred to Endowment Increment Fund	5.48	22.30
Balance, December 31, 1924		$ 26.45

4. *Benjamin Stuart Gager Memorial Fund* ($13,417.20). *Restricted:*

Income Account:		
Balance, January 1, 1924		$ 73.73
Income 1924		695.28
		$ 769.01
Expended	$ 473.62	
Transferred to Endowment Increment Fund	139.04	612.66
Balance, December 31, 1924		$ 156.35

5. *Martha Woodward Stutzer Memorial Fund* ($5,000.00). *Restricted:*

Income Account:		
Balance, January 1, 1924		$ 7.53
Income 1924		290.65
		$ 298.18
Expended	$ 57.24	
Transferred to Endowment Increment Fund	55.00	
Transferred to Tuition and Sales Instruction	185.94	298.18
		$ 0.00

6. *Mary Bates Spalding Fund* ($1,697.00). *Restricted:*

Income Account:		
Balance, January 1, 1924		$ 125.97
Income 1924		93.32
		$ 219.29
Expended	$ 65.00	
Transferred to Endowment Increment Fund	18.66	83.66
Balance, December 31, 1924		$ 135.63

7. *Cary Library Fund* ($10,000.00—1/5 of Income to Brooklyn Botanic Garden). *Restricted:*

Income Account:		
Balance, January 1, 1924		$ 15.77
Income 1924		110.00
		$ 125.77
Expended	$ 61.16	
Transferred to Endowment Increment Fund	22.00	83.16
Balance, December 31, 1924		$ 42.61

8. *Special Fund* (*Brooklyn Institute General Endowment Income: Annual Allotment*). *Restricted:*

Income Account:	
Income 1924	$ 1,280.00
Transferred to Special Contributions	1,280.00
	$ 0.00

9. *Botanic Garden Collections Fund, 1924. Restricted:*

Transferred from Collections Fund 1923		$ 154.78
Received from Contributions 1924		7,759.00
		$ 7,913.78
Expended	$ 5,919.23	
Transferred to Special Contributions	1,500.00	7,419.23
Balance, December 31, 1924		$ 494.55

10. *Sustaining Membership. Restricted:*

Received from dues 1924		$ 391.53
Transferred to Endowment Increment Fund	$ 78.30	
Transferred to Tuition and Sales Incidental	8.07	
Transferred to Tuition and Sales Instruction	305.16	391.53
		$ 0.00

11. *Annual Membership. Restricted:*

Received from dues 1924		$ 3,350.00
Expended	$ 5,228.07	
Transferred to Endowment Increment Fund	1,144.00	6,372.07
Deficit, December 31, 1924		$ 3,022.07

12. *Tuition and Sales. Restricted:*

Balance January 1, 1924		$ 1,346.66
Received, 1924:		
(*a*) Tuition	$ 3,232.08	
(*b*) Seed Packets	4,430.69	
(*c*) Incidentals	651.24	8,314.01
		$ 9,660.67
Expended	$ 4,889.98	
Transferred to Endowment Increment Fund	1,238.74	
Transferred to Special Contributions	2,361.70	8,490.42
Balance, December 31, 1924		$ 1,170.25

13. *Special Purposes. Restricted by terms of gift:*

(*a*) Anonymous for Japanese Garden:

Balance, January 1, 1924	$	29.48
Received		500.00
	$	529.48
Expended		500.00
Balance, December 31, 1924	$	29.48

(*b*) Mr. George D. Pratt for Children's Room:

Balance, January 1, 1924	$	61.59
Expended		11.65
Balance, December 31, 1924	$	49.94

(*c*) Mrs. James H. Post for Furniture for Children's Building:

Received	$	250.00
Expended		250.00
	$	0.00

Summary of Special Purposes Account:

Balance, January 1, 1924	$	91.07
Received		750.00
	$	841.07
Expended		761.65
Balance, December 31, 1924	$	79.42

14. *Special Contributions (for 1924 only):*

Contributed	$	182.00
Transferred from Endowment Fund Income Account		3,808.73
Transferred from Special Fund		1,280.00
Transferred from Special Account W		9,000.00
Transferred from A. T. White Memorial Tablet Fund		100.00
Transferred from A. Augustus Healy Bequest		430.00
Transferred from Collections Fund		1,500.00
Transferred from Tuition and Sales		2,361.70
		$18,662.43
Expended		22,064.09
Deficit, December 31, 1924	$	3,401.66

15. *Special Account W. Restricted:*

Income Account:		
Income 1924		$13,707.46
Expended	$ 1,965.97	
Transferred to Endowment Increment Fund	2,741.49	
Transferred to Special Contributions	9,000.00	13,707.46
		$ 0.00

16. *Plant Pathology Research Fund. Restricted:*

Balance, January 1, 1924		$ 926.99
Income 1924		10,000.00
		$10,926.99
Expended		10,719.13
Balance, December 31, 1924		$ 207.86

17. *A. Augustus Healy Bequest* ($9,798.31). *Restricted:*

Income 1924		$ 538.70
Transferred to Endowment Increment Fund	$ 107.70	
Transferred to Special Contributions	430.00	
Transferred to Tuition and Sales Instruction	1.00	538.70
		$ 0.00

18. *A. T. White Memorial Tablet Fund. Restricted:*

Income 1924		$ 212.85
Expended	$ 8.19	
Transferred to Endowment Increment Fund	42.57	
Transferred to Special Contributions	100.00	150.76
Balance, December 31, 1924		$ 62.09

19. *R. B. Woodward Bequest* ($25,000.00). *Restricted:*

Income Account:		
Income 1924		$ 343.75
Transferred to Tuition and Sales Instruction		343.75
		$ 0.00

20. *Endowment Increment Fund. Restricted:*

Transferred from other accounts, 1924		$ 5,647.98
Interest 1924		831.92
		$ 6,479.90
Transferred to Principal		6,479.90
		$ 0.00

Summary of Private Funds Accounts:

Balance, January 1, 1924		$ 2,763.77
Income 1924		52,779.68
		$55,543.45
Expended	$51,980.15	
Transferred to Endowment Increment Principal	6,479.90	58,460.05
Deficit, December 31, 1924		$ 2,916.60

APPENDIX 1

GIFTS RECEIVED DURING 1924

Collections Fund

Miss E. Addie Austin
Mr. Frank L. Babbott
Mr. Frank Bailey
Mr. David A. Boody
Miss Mary A. Brackett
Mrs. C. R. Buckley
Miss Theodora Buckley
Dr. & Mrs. Glentworth R. Butler
Mrs. Edward R. Coker
Mr. Wm. C. Courtney
Mr. Walter H. Crittenden
Mrs. Alice C. Crowell
Mr. Albert De Silver
Mr. Otto Ebel
Mr. Charles Ericson
Mrs. Lewis W. Francis
Mr. John W. Frothingham
Mr. & Mrs. James M. Hills
Mrs. John Hills
Mrs. Francis T. Ingraham
Mr. A. W. Jenkins
Mrs. A. S. Kirkman
Miss Julia W. Latimer
Mrs. J. W. Littlejohn
Miss Hilda Loines
Mrs. John Bradley Lord
Mr. William G. Low
Mr. James L. Morgan
Mr. Horace J. Morse
Mrs. Charles E. Perkins
Miss Julia J. Pierrepont
Mrs. Fredic B. Pratt
Mr. George D. Pratt
Mr. William A. Putnam
Mrs. William A. Putnam
Miss Lilian Sanger
Mr. W. B. Seymour
Mr. F. H. Sloan
Mr. Harold Somers
Mrs. Mary Bates Spalding
Dr. Edward H. Squibb
Mrs. Seth Thayer Stewart
Mr. E. C. Straughton
Mr. Herman Stutzer
Mrs. Mary Van Norden
Mr. Edwin G. Warner
Miss F. E. White
Miss H. H. White
Mr. Harold F. White
Mrs. Y. Willenbrock
Miss Mary Blackburne Woodward

Living Plants

Mr. H. S. Adams, 1 *Agave*, 1 *Tillandsia*.
Bobbink and Atkins, 58 plants of 29 varieties of Asters, 60 plants of 30 varieties of Japanese Iris.
Mr. Lee R. Bonnewitz, 7 Iris.
Bureau of Plant Industry, U.S.D.A., 58 plants of 31 kinds.
Prof. M. A. Chrysler, 3 *Microcycas*.
Mrs. Frances E. Cleveland, 9 Iris.
Mr. Willard N. Clute, 12 *Actinella*.
Mrs. F. E. Cook (through Mrs. H. A. Gleason), 2 Iris.
Mr. Bertrand H. Farr, 42 Iris.
Mr. Frederick J. Grevè, 3 *Selaginella*.
Hicks Nurseries, 5 each of 6 varieties of Juniper.
Prof. Henry D. Hooker, Jr., Scions of 14 kinds of crabapple.
H. S. Jackson, 8 Iris.
Dr. D. S. Johnson, 4 *Leitneria*.
J. F. Jones, 2 *Juglans regia*.
Mrs. E. M. McCrory, 3 *Polypodium*, 1 *Polystichum*.
Miss S. M. Martin, 1 *Pyxidanthera*.
Mr. J. Ohga, 8 Seedlings of *Nelumbo* sp.
Mrs. C. M. Pratt, 3 *Cyphomandra*, 3 *Grevillea*.
Mr. F. W. Schmoe, Forest and Western Anemones.
Seabrook Company, 25 each of 35 varieties of Tulip; 4,000 Bulbs of *Tulipa Gesneriana major*.
Mr. Frank Stoll, 3 *Symplocarpus*.
Mr. Earl F. Theisinger, 21 plants of 4 kinds.

Seeds

Prof. E. B. Babcock (1)
Mrs. E. G. Britton (1)
Bureau of Plant Industry, U.S.D.A. (1)
Mrs. Glentworth R. Butler (1)
Mr. Lorentz Cantor (6)
Mr. G. O. Carlton (1)
Prof. Charles J. Chamberlain (1)
Prof. M. A. Chrysler (3)
Mr. J. A. Currey (1)
Mr. Francis N. Fast (1)
Dr. A. H. Graves (5)
Mr. Roy Latham (1)
Mr. Oswald H. Latter (1)
Mr. G. Locke (2)
Mr. Barrington Moore (1)
Mr. Geo. F. Norton (1)
Mr. J. Ohga (1)

Phanerogamic Herbarium

Mr. Frank Stoll, Brooklyn Botanic Garden,
1 coconut fruit from Florida.
Mr. W. C. Ferguson, 37 Atlantic Avenue, Hempstead, L. I.,
457 specimens from Long Island.
American Museum of Natural History,
34 specimens from the South Sea Islands.

Dr. R. C. Benedict, Brooklyn Botanic Garden,
39 specimens:
Dryopteris dilatata from Byfields, Mass., collected by Mr. Edward Clarkson.
Adiantum Capillis-Veneris from Windham, N. Y., collected by Miss Clara Watkins.
37 ferns collected in Cass, West Virginia, by Rev. F. W. Gray.
Mr. E. P. Martin,
100 plants collected near Flushing, L. I., in 1845.
Miss Anna J. Pierrepont,
Ferns and flowering plants of Florida.
Miss Beatrice Underwood,
7 plants from Wood Island, Alaska.
Miss Anna H. Taylor, 6 Priscilla Alden Road, Providence, R. I.,
32 specimens from British Guiana.

Cryptogamic Herbarium

Dr. David Griffiths, Bureau of Plant Industry, Washington, D. C.,
5 herbarium specimens of fungi.
Dr. L. Hecke, Lehrkanzel für Phytopathologie, Hochschule für Bodenkultur, Vienna, Austria.
6 herbarium specimens of fungi.

Library

Books

American Scenic and Historic Preservation Society, New York City	1
Mr. Poultney Bigelow, Malden-on-Hudson, N. Y.	1
Brooklyn Museum Library, Brooklyn, N. Y.	10
Carnegie Institution of Washington, Washington, D. C.	7
Miss Louise Driscoll, Catskill, N. Y.	1
Dr. J. A. Faris, Cienfuegos, Cuba	1
Dr. C. S. Gager, Brooklyn, N. Y.	8
Mr. Herman Knoche, San José, California	1
Dr. Shunsuke Kusano, Botanical Institute, Tokio Imperial University, Tokio, Japan	1
Mr. C. G. Lloyd, Lloyd Library, Cincinnati, Ohio	3
Miss Evelyn Meyenborg, Brooklyn, N. Y.	1
Mothers' Club, P. S. 47, Brooklyn, N. Y.	1
New York State Library, Albany, N. Y.	10
Miss Bernice Schubert, Brooklyn, N. Y.	1
Mr. George B. Sudworth, Washington, D. C.	1
Mr. Harold W. Uhrbrock, Brooklyn, N. Y.	1
Dr. N. I. Vavilov, Petrograd, Russia	1
Total	*50

* The number of volumes received as gifts is not necessarily the number accessioned during the year. Some may be unrelated to our subjects, and may have been transferred to other institutions in exchange.

Pamphlets

Mr. Frank Bailey, Brooklyn, N. Y.	1
Prof. William Bateson, London, Eng.	6
Brooklyn Museum Library, Brooklyn, N. Y.	7
Carnegie Institution of Washington, Washington, D. C.	5
Carnegie Institution of Washington, Station for Experimental Evolution, Cold Spring Harbor, L. I.	17
Dr. J. A. Faris, Cienfuegos, Cuba	2
Dr. O. A. Farwell, Detroit, Mich.	3
Mr. Montague Free, Brooklyn, N. Y.	1
Dr. C. S. Gager, Brooklyn, N. Y.	92
Prof. John W. Harshberger, Philadelphia, Pa.	7
Prof. John W. Holzinger, Winona, Minn.	2
Dr. W. D. Horne, Yonkers, N. Y.	5
International Harvester Co., Chicago, Ill.	1
Prof. H. M. Jamison, Knoxville, Tenn.	1
Dr. Aniela Kozlowska, Cracow, Poland	1
Prof. Francis E. Lloyd, Montreal, Canada	1
Prof. E. D. Merrill, Manila, P. I.	1
Major Barrington Moore, New York City	6
Ohio Botanic Garden Society, Cincinnati, O.	1
Prof. S. J. Record, New Haven, Conn.	1
Prof. C. S. Sargent, Brookline, Mass.	1
Miss Ellen Eddy Shaw, Brooklyn, N. Y.	1
Miss Ray Simpson, Brooklyn, N. Y.	1
Dr. Dezydery Szymkiewicz, Warsaw, Poland	1
Mr. Norman Taylor, Brooklyn, N. Y.	1
Mr. F. W. Van Oven, Naperville, Ill.	1
Dr. Orland E. White, Brooklyn, N. Y.	1
Total	168

Parts of Publications

Exclusive of U. S. Government Documents

American Medical Publishing Co., New York City	1
Prof. William Bateson, London, Eng.	3
Dr. Ralph C. Benedict, Brooklyn, N. Y.	1
Brooklyn Daily Eagle, Brooklyn, N. Y.	1
California, University of, Berkeley, Cal.	46
Carnegie Institution of Washington, Washington, D. C.	3
Dr. J. A. Faris, Cienfuegos, Cuba	37
Miss M. O. Ford, Brooklyn, N. Y.	2
Mr. Montague Free, Brooklyn, N. Y.	63
Dr. C. S. Gager, Brooklyn, N. Y.	134
Dr. A. H. Graves, Brooklyn, N. Y.	18
Dr. Alfred Gundersen, Brooklyn, N. Y.	13
Mrs. Clarence R. Hyde, Brooklyn, N. Y.	12

Mr. LeRoy Jeffers, New York City	1
Mr. Robert Lovedahl, Brooklyn, N. Y.	5
Major Barrington Moore, New York City	6
National Research Council, Washington, D. C.	1
New York Academy of Sciences, New York City	24
New York (City) Dept. of Health, New York City	58
New York (State) Conservation Commission, Albany, N. Y.	2
Dr. George M. Reed, Brooklyn, N. Y.	19
Miss Ellen Eddy Shaw, Brooklyn, N. Y.	1
Miss Ray Simpson, Brooklyn, N. Y.	1
Mrs. A. M. Smith, Bronxville, N. Y.	3
Mr. Norman Taylor, Brooklyn, N. Y.	71
Dr. Orland E. White, Brooklyn, N. Y.	12
Wild Flower Preservation Society of America, Washington, D. C.	4
Woman's National Farm and Garden Association, New York City	3
Total	545

Portraits

Dr. H. D. House, Albany, N. Y.	1
Dr. Phil Bernt Lynge, Universitets Botaniske Museum, Kristiania, Norway	1
Dr. George J. Peirce, Stanford University, California	1
Total	3

To the Department of Elementary Instruction

Anonymous, Six hundred tulip bulbs for the children's garden.

Arnold and Aborn, Samples of raw and roasted coffee and coffee pot for demonstration purposes in classwork.

Blood, Miss Mildred, $5 for books for the children's library.

Butler, Mrs. Glentworth R., One prize cup to be competed for by the girls of the 1924 outdoor garden.

Columbia Dames, $2 for roses for the children's garden.

Delafield, Mrs. John, $5 for books for the children's library.

Flatbush Garden League, Two prize books for the boy and girl making the greatest progress in garden work in 1924.

Francis, Mrs. Lewis W., $5 for books for the children's library.

Garden Teachers' Association, One prize cup to be competed for by the boys of the 1924 outdoor garden.

Guthman, Mr. Joel, $1 for books for the children's library.

Lipton, Sir Thomas, Two moving-picture reels on the tea industry.

Lloyd, Mrs. T. M., An original reprint of a poem on "Iris."

Loines, Miss Hilda, One picture for the children's room.

Meyenborg, Miss Evelyn, $3.50 for books for the children's library.

Mothers' Club of the Alice E. Fitts Kindergarten, $5 for the children's room

Mothers' Club, P. S. 47, $3.50 for books for the children's library.

Post, Mrs. James H. (through Mrs. Glentworth R. Butler), $250 for furniture for the children's garden house.

Post, Miss Jessie W., $25 for books for the children's library.

Schubert, Miss Bernice, $2 for books for the children's library.

Shaw, Miss Ellen Eddy, Three gold honor pins for honorable service in the 1924 outdoor garden.

Weber, Mrs. William O., $10 for books for the children's library.

Woman's Auxiliary of the Brooklyn Botanic Garden, $19 for the children's room.

Wood, Dr. Robert L., $4 for books for the children's library.

Note.—Numerous gifts of books, and books for the children's library purchased with gifts of money acknowledged above, are listed in the Report of the Librarian (p. 71).

Miscellaneous

Miss C. E. Dudley, 159 Willow Street, Brooklyn. 1 old French microscope.

Mr. C. P. Freeman, Willowbrook, Calif. 1 specimen of mistletoe.

APPENDIX 2

PUBLICATIONS OF MEMBERS OF STAFF DURING 1924

Benedict, R. C.

—— The moss-leaved fern. *Jour. of Hered.* **15**: 19–24. Jan.

—— The conservation of beauty. *Brooklyn Bot. Gard. Leaflets* **XII**[2]. April 10.

—— Problems in the study of the spinulose ferns. *Amer. Fern Jour.* **14**: 69–74. July–Sept.

—— Variation among sporelings of a fertile sport of Boston fern. *Jour. of Hered.* **15**: 379–394. Sept.; **15**: 421–431. Oct. (*Brooklyn Bot. Gard. Contrib.* No. 42.)

—— Opportunities for scientist in the New York high school. *Sci.* **45**: 524–525. Dec. 5.

—— Scope of biology examinations. *Bulletin* of the New York Society for the Experimental Study of Education **6**: Dec.

Faris, James A.

—— Factors influencing infection of *Hordeum sativum* by *Ustilago hordei*. *Amer. Jour. Bot.* **11**: 189–214. March. (*Brooklyn Bot. Gard. Contrib.* No. 35.)

—— Factors influencing the infection of wheat by *Tilletia tritici* and *Tilletia laevis*. *Mycologia* **16**: 259–282. Nov. (*Brooklyn Bot. Gard. Contrib.* No. 41.)

—— Physiological specialization of *Ustilago hordei*. *Phytopathology* **14**: 537–557. Dec. (*Brooklyn Bot. Gard. Contrib.* No. 40.)

Free, Montague

—— Bulb planting, 1923. *Brooklyn Bot. Gard. Record* **13**: 21–22. Jan.

—— A most easily grown three dozen. *Gard. Mag.* **39**: 1. March.

—— Flowers of the rock garden. *Brooklyn Bot. Gard. Leaflets*, Series **XII**[3]. April 30.

—— Rock gardens. *Gard. Chron. Amer.* **28**: 5. May.

—— Rock gardens. *Jour. New York Hort. Soc.* 1924.

Gager, C. Stuart

—— The botanic garden as a cultural agent. *Brooklyn Daily Times*, March 2, 1923. (Omitted from the preceding report.)

—— Sinnott's Botany (Review). *Sci.* **59**: 319–320. April 4.

—— Thirteenth Annual Report of the Brooklyn Botanic Garden, 1923. Report of the Director. *Brooklyn Bot. Gard. Rec.* **13**: 25–53. April.

—— Transeau's General Botany (Review). *Ecology* **5**: 207. April.

—— The educational value of a botanic garden. *Museum Work* **7**: 3–10. May–June.

—— Venus's Flytrap in bloom. *Brooklyn Bot. Gard. Rec.* **13**: 128–130. July.

—— Brooklyn Botanic Garden. *Bull. Gard. Club of America* Ap. 2–4. Nov. 1924.

—— 10 Abstracts of botanical publications in Nos. 4, 6, 8, 9, and 11 of *Botanical Abstracts*.

Graves, Arthur Harmount

—— Report of the Curator of Public Instruction for 1923. *Brooklyn Bot. Gard. Rec.* **13**: 62–67. April.

—— The lotus. *Brooklyn Bot. Gard. Leaflets* **XII**[7]. September 17.

—— Some common horticultural questions I. When and how to transplant trees and shrubs: winter care of dahlias and cannas. *Brooklyn Bot. Gard. Leaflets* **XII**[10]. October 29.

—— 95 newspaper articles relating to the Brooklyn Botanic Garden.

—— 15 abstracts of botanical books and pamphlets in botanical education section of *Botanical Abstracts*, Vol. 13.

Gundersen, Alfred

—— Families of Dicotyledons. *Brooklyn Bot. Gard. Leaflets*, **XII**[4] May 14.

—— Trees of the Brooklyn Botanic Garden and Prospect Park. *Brooklyn Bot. Gard. Leaflets*, **XII**[8, 9] Oct. 15.

Reed, George M.

—— Irises. *Brooklyn Bot. Gard. Leaflets* **XII**[5, 6]. June 11.

—— The smuts of cereals: their nature, economic importance, and the significance of recent discoveries. *Brooklyn Bot. Gard. Rec.* **13**: 103–124. July.

—— Physiologic races of oat smuts. *Amer. Jour. Bot.* **11**: 483–492. July. (*Brooklyn Bot. Gard. Contrib.* No. 38.)

—— Varietal susceptibility of wheat to *Tilletia laevis* Kühn. *Phytopathology* **14**: 437–450. Oct.

Reed, George M., and Faris, James A.

—— Influence of environal factors on the infection of sorghums and oats by smuts. I. Experiments with covered and loose kernel smuts of sorghum. *Amer. Jour. Bot.* **11**: 518–534. Oct. (*Brooklyn Bot. Gard. Contrib.* No. 36.)

—— Influence of environal factors on the infection of sorghums and oats by smuts. II. Experiments with covered smut of oats and general considerations. *Amer. Jour. Bot.* **11**: 579–599. Nov. (*Brooklyn Bot. Gard. Contrib.* No. 37.)

Shaw, Ellen Eddy

—— A letter from Billy to Peter and Jerry. *Junior Home Mag.* **V**: 9. Jan.
—— Plant babies. *Junior Home Mag.* **V**: 9. Feb.
—— Well-behaved house plants. *Junior Home Mag.* **V**: 9. March.
—— Wayside gardens. *Natl. Plant, Flower and Fruit Guild Mag.* **13**: 9–10. March.
—— How to start a miniature garden. *Junior Home Mag.* **V**: 9. April.
—— Eleventh annual garden exhibit for Brooklyn boys and girls. *Brooklyn Bot. Gard. Leaflets* **XII**[1]. April 2.
—— Report of the Curator of Elementary Instruction for 1923. *Brooklyn Bot. Gard. Rec.* **13**: 67–70. April.
—— Plants that eat animals. *Junior Home Mag.* **V**: 9. May.
—— How does your garden grow? *Junior Home Mag.* **V**: 9. June.
—— Peter finds some signboards. *Junior Home Mag.* **V**: 12. Aug.
—— Cocoon hunting. *Junior Home Mag.* **V**: 10. Oct.
—— A letter from Peter to Jerry. *Junior Home Mag.* **V**: 13. Dec.

Simpson, Ray

—— Report of the Librarian for 1923. *Brooklyn Bot. Gard. Rec.* **13**: 72–77. April.

Taylor, N.

—— Report of the Curator of Plants and Plantations for 1923. *Brooklyn Bot. Gard. Rec.* **13**: 55–61. April.
—— Practical Plant Ecology By A. G. Tansley. (Review). *Literary Review, New York Evening Post.* May.

Taylor, N., and Hill, H. S.

—— Crowberry at Montauk. *Torreya* **24**: 87. Sept.–Oct.

White, Orland E.

—— Numerous abstracts of botanical papers in The Genetics Section of *Botanical Abstracts*.

—— Mankind at the Cross Roads. (A review.) *Birth Control Review* 8: 55–56. Feb. 1924.

APPENDIX 3

TALKS, PUBLIC LECTURES, ADDRESSES, AND PAPERS GIVEN BY MEMBERS OF STAFF DURING 1924

By the Director of the Garden:

January 21. *The value of the Brooklyn Botanic Garden to Greater New York.* Cambridge Club and Presidents of all Brooklyn Clubs. 205 Rugby Road, Brooklyn.

April 29. *The growth and importance of the Brooklyn Botanic Garden.* Men's League, Flatbush Congregational Church.

May 17. *The development and activities of the Brooklyn Botanic Garden.* Lake Mohonk Mountain House, Mohonk Lake, N. Y.

October 5. *The civic importance of a botanic garden.* Men's Club, Wantagh Memorial Church, Wantagh, L. I.

October 6. *The relation between science and religion: How to think about it.* Men's Club, Grace Reformed Church, Brooklyn.

November 20. *The greatest need in forest conservation.* New York Bird and Tree Club. Hotel Roosevelt.

By the Curator of Plants and Plantations:

March 17. *Tropical African Forests.* Brooklyn Botanic Garden.

August 19. *Shrubs and Trees.* East Hampton Garden Club.

September 2. *The Effect of Wind on the Vegetation of Montauk.* Montauk Cottage Colony.

October 4. *The Sun, the Wind, and the Gardener.* New York Botanical Garden.

By the Curator of Plants:

December 29. *Some Comparisons between the Cactaceae and the Aizoaceae.* Before the Systematic Section, Botanical Society of America, in Washington.

By the Horticulturist:

January 15. *Rock gardens.* Pennsylvania Horticultural Society, Philadelphia, Pennsylvania.

March 19. *Rock gardens.* Middletown Garden Club, Middletown, Connecticut.

May 6. *English gardens.* Winter's Night Club, Brooklyn Botanic Garden.

May 18. *Rock gardens.* Brooklyn Botanic Garden.

May 19. *English gardens.* Ridgewood Garden Club, Ridgewood, New Jersey.

May 22. *Down to Kew in lilac time.* Upper School, Public School No. 36 at Brooklyn Botanic Garden.

September 24. *Alpines.* Philipstown Garden Club, Cold Spring-on-Hudson, New York.

By the Curator of Plant Breeding and Economic Plants:

February 12. *The Amazonian wilderness.* Torrey Botanical Club at the American Museum of Natural History.

February 13. *Bolivian wildernesses and cities.* The Garden Club of Ridgewood, N. J.

March 11. *The two Bolivias.* Annual banquet, Story Teller's Club of Brooklyn, Flatbush Congregational Church.

March 12. *The art of plant breeding.* The Garden Club of Ridgewood, N. J.

April 2. *Variation, heredity and environment.* Biological Club, Boys' High School, Brooklyn.

April 11. *Bolivian wildernesses and cities.* Annual Evening Meeting of the Vandeveer Park Mothers' Club, Brooklyn.

May 4. *Tropical plants in our daily lives.* Brooklyn Botanic Garden.

May 19. *The laws of heredity and plant breeding.* Biology Class, Manual Training High School, at the Brooklyn Botanic Garden.

May 21. *The relation of environment and heredity.* Biology Class, Manual Training High School, at the Brooklyn Botanic Garden.

June 29. *Bolivian roads and trails.* New York Botanical Garden.

December 3. *Environment and heredity.* Walden School.

By the Curator of Plant Pathology:

March 26. *Story of Wheat.* Boys' High School, Brooklyn.

June 1. *Irises.* Brooklyn Botanic Garden.

Oct. 10. *Studies on the inheritance of smut resistance in oats and sorghums.* Biological Seminary, Princeton University.

Oct. 21. *Some recent investigations concerning the cereal smuts.* Dept. of Botany, Brooklyn Institute of Arts and Sciences, Brooklyn Botanic Garden.

By the Research Fellow:

April 30. *Factors influencing infection in the covered smut of barley.* Torrey Botanical Club, Brooklyn Botanic Garden.

By the Curator of Public Instruction:

February 4. *The work of the Brooklyn Botanic Garden.* Athena Club, Freeport High School.

February 20. *How to answer the critics of evolution.* Natural Science Club, Boys' High School.

February 20. *Growth and cell-division.* The Advanced Biology Club, Boys' High School.

March 6. *Conservation.* Bushwick High School Annex.

March 11. *Diseases of trees.* Institute for the Instruction of Tree Workers, Connecticut Agricultural Experiment Station, New Haven, Conn.

April 8. *The civic value of trees.* Torrey Botanical Club, American Museum of Natural History.

April 15. *The conservation of beauty.* Two assemblies, Girls' Commercial High School.

April 24. *The Brooklyn Botanic Garden.* Nature Club, Huntington, L. I.

April 25. *The work of the Brooklyn Botanic Garden.* Moguewetu Tribe of Woodcraft League of America, Children's Museum.

April 27. *The trees of Greater New York.* Public lecture, Brooklyn Botanic Garden.

May 14. *Conservation of American wild flowers.* Advanced Biology Club, Boys' High School.

May 27. *Our native trees.* Rye Garden Club, Rye, N. Y.

November 20. *Conservation and responsibility.* Waverly Annex, Boys' High School.

November 21. *The work of the Brooklyn Botanic Garden.* Monitor Chapter of the Daughters of the Union, Brooklyn.

December 12. *The essential unity of the plant and animal kingdoms.* Advanced Biology Club, Boys' High School.

By the Curator of Elementary Instruction:

January 10. *Plants and their uses.* The Lincoln School, Teachers' College, New York.

January 29. *Graduation address.* P. S. 47.

February 14. *The meaning of plants.* Ethical Culture School, New York.

February 19. *Plants for the classroom.* P. S. 158.

February 27. *Children's garden work: a training in citizenship.* Ramapo Valley Chapter of Daughters of Revolution, Ridgewood, N. J.

March 11. *A demonstration school garden.* American Museum of Natural History.

March 18. *How to plant a garden.* Two assemblies, P. S. 158.

March 20. *Gardening for boys and girls: a training for good citizenship.* Colony Club of Queens.

March 25. *Backyard gardens.* Two assemblies, P. S. 152.

March 25. *Backyard gardens.* Mothers' Club, P. S. 133.

March 26. *What the Brooklyn Botanic Garden offers to Brooklyn children.* Grace Church Kindergarten Mothers' Club.

March 27. *Children's activities at the Brooklyn Botanic Garden.* Mothers' Club, P. S. 107, at the Garden.

April 1. *Forestry.* P. S. 5.

April 3. *The work of the Brooklyn Botanic Garden with children.* Hoagland Kindergarten.

April 3. *What the Botanic Garden does for Brooklyn boys and girls.* Mothers' Club, P. S. 161.

April 7. *Soils in relation to the small garden's needs.* Garden Club of Larchmont.

April 9. *Opportunities offered to children by the Brooklyn Botanic Garden.* Junior League, at the Garden.

April 11. *Spring and nature.* Two assemblies at P. S. 139.

April 17. *Commercial plant products.* P. S. 165.

April 25. *Children's gardens.* Stroudsburg Civic Club.

April 30. *The work the Brooklyn Botanic Garden does for children.* Mothers' Clubs, P. S. 127 and Alice E. Fitts Kindergarten, at the Garden.

May 6. *Children's activities at the Brooklyn Botanic Garden.* Mothers' Club, P. S. 47, at the Garden.

May 7. *Children's gardens.* Columbia Dames, Barnard College Hall.

May 8. *The children's garden at the Brooklyn Botanic Garden.* Clinton Avenue Congregational Church.

May 14. *The cooperation between the Brooklyn Botanic Garden and the Heads of Department.* The Heads of Department Association of the Borough of Brooklyn, at the Garden.

May 20. *The work of the Brooklyn Botanic Garden with children.* Mothers' Club, P. S. 89, at the Garden.

May 22. *Interesting plants at the Brooklyn Botanic Garden.* Mothers' Club, P. S. 106, at the Garden.

May 23. *The inspiration of nature.* Girl Scout Leaders, Lookout Hill, Prospect Park.

May 26. *Home gardens.* The Working Girls' Club, Y. W. C. A., Freeport.

May 27. *The work of the boys and girls at the Brooklyn Botanic Garden.* Brooklyn Section, New York Public School Kindergarten Association.

May 28. *The children's garden at the Brooklyn Botanic Garden.* Joint meeting of Torrey Botanical Club, New York Bird & Tree Club, American Fern Society, Wild Flower Preservation Society and Garden Clubs, at the Garden.

June 3. *Springtime at the Brooklyn Botanic Garden.* Class from Packer Collegiate Institute.

June 4. *Educational opportunities at the Brooklyn Botanic Garden.* Class from Maxwell Training School.

June 5. *Springtime at the Brooklyn Botanic Garden.* Class from Friends' School, at the Garden.

June 9. *What children may learn from nature in their summer holidays.* Assembly and Mothers' Club, P. S. 185.

June 10. *What the Brooklyn Botanic Garden does for children.* Mothers' Clubs, The First Free Kindergarten, C. W. Barrett Kindergarten, and the Fellowship of the Life More Abundant, at the Garden.

June 25. *The pleasure in raising plants.* P. S. 41.

October 2. *How the Brooklyn Botanic Garden helps to make better citizens.* Society of Old Brooklynites.

October 9. *The activities of the Brooklyn Botanic Garden.* Columbia Dames, at the Garden.

October 16. *The care of house plants and window boxes.* Mothers' Club, P. S. 76.

October 16. *The care of window boxes.* Mothers' Club, P. S. 112, Mrs. F. B. Arvine, Brooklyn Botanic Garden graduate, for the Curator.

October 18. *What the Brooklyn Botanic Garden offers to Brooklyn children.* Battle Pass Chapter, Daughters of the American Revolution, at the Garden.

October 21. *Indoor plant work with children.* Mothers' Club, P. S. 89.

October 27. *Address at presentation of Exhibit prize.* P. S. 49.

November 3. *The work of nature.* P. S. 77.

November 6. *The work of the Brooklyn Botanic Garden.* Mothers' Club, P. S. 66, Queens.

November 10. *Bulb planting and indoor nature work with children.* Mothers' Club, Great Neck, Long Island.

November 13. *Preparation of Girl Scouts for nature tests.* Girl Scout House.

November 14. *Making plant collections for school.* Three assemblies, P. S. 185.

December 19. *Christmas plants.* Two assemblies, P. S. 41.

December 31. *The work of the Brooklyn Botanic Garden.* Central Congregational church, Miss Hilda Loines, Chairman of the Woman's Auxiliary, for the Curator.

By the Librarian:

Jan. 24. *How Can Information which Cataloguers Accumulate Be Made Available to Other Departments.* N. Y. Cataloguers' Regional Group, New York.

May 23. *Methods in Use in the Organization and Work of the Brooklyn Botanic Garden Library.* Junior Class, Library School of the New York Public Library, annual visit at Brooklyn Botanic Garden.

By the Assistant Curator of Elementary Instruction:

March 27. *Children's activities at the Brooklyn Botanic Garden.* Mothers' Club, P. S. 131.

April 1. *Birds and their relation to agriculture.* P. S. 158.

May 15. *The Brooklyn Botanic Garden and its work with boys and girls.* Mothers' Club, Model School, at the Garden.

June 17. *The Brooklyn Botanic Garden and its educational work.* Mothers' Club, P. S. 185, at the Garden.

By Instructors:

February 4. *Plants for the classroom.* Jamaica Training School, Miss Sanders.

March 4. *Spring Wild Flowers.* P. S. 158, Miss Sanders.

October 2. *House plants and their care.* Mothers' Club, P. S. 56, Miss Turner.

APPENDIX 4

REPORT ON BROOKLYN BOTANIC GARDEN PUBLICATIONS, 1924

American Journal of Botany.—Official publication of the Botanical Society of America, and published in cooperation with the Society. Monthly, except August and September. The ten issues for 1924 constitute Volume XI, with 51 articles on various phases of botany, 656 pages (an increase of 80 pages over last year), 41 plates, and 59 text-figures. The circulation, as of November 31 (the close of the fiscal year of the *Journal*), was 1,203. Prof. C. E. Allen, University of Wisconsin, continued as editor-in-chief, with an editorial board of eight, of which the

business manager (the director of the Garden) and one of the editors (at present, Dr. Arthur Harmount Graves) are appointed by the Botanic Garden. One editor is elected by the American Phytopathological Society, and the others by the Botanical Society of America.

Ecology.—Official publication of the Ecological Society of America. Quarterly. The editorial board is elected by the Ecological Society, with the exception of the business manager (the director of the Botanic Garden) and one editor (at present, Mr. Norman Taylor) who are appointed by the Botanic Garden. Volume V, 1924, contains 42 original papers, besides notes and comment, reviews, and abstracts of current ecological literature, and proceedings of the annual meeting of the Society. There were 427 pages, with 3 plates and 57 text-figures.

Genetics.—Published bi-monthly in cooperation with the Editorial Board of *Genetics;* Prof. George H. Shull, Princeton University, managing editor. This journal is a periodical record of investigations bearing on heredity and variation in both plants and animals. The director of the Botanic Garden is business manager. During 1924 there have been published five issues (November, 1923, and January–July, 1924) containing 23 articles, 507 pages, 6 plates, and 49 text-figures.

Record.—Administrative quarterly. The October issue contains the annual *Prospectus* of the educational work of the Garden, the April number comprises the *Annual Report* of the Garden, and the January issue will (beginning with 1925) comprise the annual *List of Seeds* offered in exchange with other botanic gardens. The October number is reserved for miscellaneous administrative matters. The RECORD is sent free to all Botanic Garden members. Volume XIII, 1924, contains 155 pages and 16 half-tone illustrations.

Contributions.—Numbers 35, 36, 37, 38, 40, 41, and 42 were published during the year. Each number is a paper reprinted from the original place of publication.

Leaflets.—Series XII comprised 10 numbers, of which Nos. 1–6 appeared during April–June and Nos. 7–10 during September–October. This publication is sent free to members of the Garden and, on request, to teachers in the city schools.

Seed List.—This was a separate publication for the first ten

years (1914–1923). Beginning with the list of 1924 collections it is being published in the January issue of the Brooklyn Botanic Garden RECORD, appearing for the first time in the RECORD for January, 1925.

Research Papers.—The total number of pages of research papers published during 1924 was 1,683 as against 1,741 in 1923, and 1,375 in 1922.

APPENDIX 5

MEETINGS OF SOCIETIES AND OTHER ORGANIZATIONS AT THE GARDEN, 1924

January 16. Delegates from educational institutions of Brooklyn by invitation of American Woman's Club of Paris and Brooklyn Botanic Garden to observe educational motion-picture film on France.
March 22. Green Mountain Club.
April 9. Junior League of Brooklyn.
April 30. Mothers' Club, P. S. 127.
April 30. Alice E. Fitts Kindergarten.
April 30. Torrey Botanical Club.
May 4–11. Exhibit of Scoutcraft Models in Competition of Brooklyn Boy Scouts.
May 6. Winter's Night Club.
May 6. Mothers' Club, P. S. 47.
May 8. Great Neck Garden Club.
May 14. Heads of Department Association of Brooklyn.
May 14. Mothers' Club, P. S. 81, Queens.
May 15. Mothers' Club, Model School.
May 20. Mothers' Club, P. S. 89.
May 22. Mothers' Club, P. S. 106.
May 23. Library School, New York Public Library.
May 27. Brooklyn Section, New York Public School Kindergarten Association.
May 28. Torrey Botanical Club.
May 28. New York Bird & Tree Club.
May 28. Wild Flower Preservation Society.
May 28. American Fern Society.
June 10. Mothers' Club of the First Free Kindergarten.

June 10. Mothers' Club of the C. W. Barrett Kindergarten.
June 10. Fellowship of the Life More Abundant.
June 17. Mothers' Club of P. S. 185.
October 9. Columbia Dames.
October 18. Daughters of American Revolution (Battle Pass Chapter).
October 21. Botanical Department of Department of Education of Brooklyn Institute.
December 1. Girl Scout Captains.
December 16. Flatbush Garden League.

APPENDIX 6

FIELD TRIPS

By the Curator of Public Instruction:

January 27. Torrey Botanical Club. Flushing.
March 22. Green Mountain Club. Brooklyn Botanic Garden.
September 14. Torrey Botanical Club. Hunter's Island.
September 20. Botanical Department, Brooklyn Institute of Arts and Sciences. The Palisades.

By the Curator of Plants:

April 12. Torrey Botanical Club to Brooklyn Botanic Garden.
May 10. Department of Botany, Brooklyn Institute of Arts and Sciences, Coytesville, N. J.
Oct. 26. Torrey Botanical Club, Coytesville, N. J.

APPENDIX 7

REPORT ON PHOTOGRAPHIC WORK, 1924

Negatives on file December 31, 1923	4,725
Negatives accessioned during 1924	500
Total negatives on file December 31, 1924	5,225
Lantern slides on file December 31, 1923	3,865
Lantern slides accessioned during 1924	458
Total lantern slides on file December 31, 1924	4,323

Prints on file December 31, 1923	1,051
Prints made during 1924	1,538
Used or distributed	1,038
Filed	500
Total prints on file December 31, 1924	1,551
Enlargements made	17

Respectfully submitted,
FRANK STOLL,
Custodian.

OFFICERS OF THE BOARD OF TRUSTEES

PRESIDENT
FRANK L. BABBOTT

FIRST VICE-PRESIDENT
WALTER L. CRITTENDEN

SECOND VICE-PRESIDENT
EDWARD C. BLUM

THIRD VICE-PRESIDENT
WILLIAM A. PUTNAM

TREASURER
G. FOSTER SMITH

SECRETARY
JOHN H. DENBIGH

BOTANIC GARDEN GOVERNING COMMITTEE

FRANK BAILEY, CHAIRMAN

FRANK L. BABBOTT, *Ex officio*
MRS. WILLIAM H. CARY
WALTER H. CRITTENDEN
GATES D. FAHNESTOCK
MRS. LEWIS W. FRANCIS
JOHN W. FROTHINGHAM
MISS HILDA LOINES
EDWIN P. MAYNARD
WILLIAM A. PUTNAM
ALEXANDER M. WHITE

EX-OFFICIO MEMBERS OF THE BOARD

THE MAYOR OF THE CITY OF NEW YORK
THE PRESIDENT OF THE BOROUGH OF BROOKLYN
THE COMMISSIONER OF PARKS, BOROUGH OF BROOKLYN

MEMBERS OF THE BOARD

(Trustees are Elected from the Life Membership of The Brooklyn Institute of Arts and Sciences)

Albertson, Rev. Charles Carroll, D.D.
Babbott, Frank L.
Bailey, Frank
Beers, E. LeGrand
Benedict, Henry Harper
Blum, Edward C.
Boody, Hon. David A.
Bowker, Richard R.
Brush, Dr. George W.
Cadman, Rev. S. Parkes, D.D.
Cary, Mrs. William H.
Courtney, William C.
Crane, Judge Frederick E.
Crittenden, Walter H.
Denbigh, Dr. John H.
[1] DeSilver, Albert
Dettmer, Hon. Jacob G.
Draper, Ernest G.
Fahnestock, Gates D.
Fairchild, Julian D.
Farrell, James A.
Francis, Mrs. Lewis W.
Frazier, Kenneth
Frothingham, John W.
Good, Mrs. William H.
Healy, Mrs. A. Augustus
Healy, Henry W.
Jenkins, A. W.
Kennedy, Hon. Elijah R.
Lewisohn, Adolph
Lockwood, Luke Vincent
Loines, Miss Hilda
Matheson, William J.
Maynard, Edwin P.
McCarty, Right Rev. Edward W.
Morgan, John Hill
Morse, Horace J.
[2] Peabody, Charles Jones
[3] Pell, Rev. Alfred Duane
Post, James H.
Pratt, Mrs. Frederic B.
Pratt, George D.
Putnam, William A.
Ramsay, Dick S.
Sloan, Francis H.
Smith, G. Foster
Stutzer, Herman
Underwood, John T.
Van Sinderen, Adrian
Warner, Dr. Edwin G.
White, Alexander M.

WOMAN'S AUXILIARY

MISS HILDA LOINES, CHAIRMAN

Adams, Mrs. H. M.
Affeld, Mrs. F. O.
Bailey, Mrs. Frank
Baldwin, Mrs. Wm. H.
Bartlett, Miss Agnes
Bigelow, Mrs. Edwin
Blum, Mrs. E. C.
Brackett, Miss Mary
Brewster, Mrs. Walter Shaw
Brinsmade, Miss Alice
Brown, Mrs. Stewart
Burrell, Mrs. E. A. M.
Butler, Mrs. Glentworth R.
Carpenter, Mrs. James O.
Cary, Mrs. William
Childs, Mrs. William H.

[1] Deceased, December 8, 1924.
[2] Deceased, February 24, 1924.
[3] Deceased, March 6, 1924.

Cranford, Mrs. Frederick L.
Davenport, Mrs. Henry J.
Diller, Mrs. Frank J. W.
Dreier, Mrs. H. Edward
Francis, Mrs. Lewis W.
Frank, Mrs. George
Frothingham, Mrs. John S.
Frothingham, Mrs. Theodora
Gager, Mrs. C. Stuart
Gibb, Mrs. Lewis M.
Good, Mrs. William H.
Healy, Mrs. A. Augustus
Hills, Mrs. James M.
Hills, Mrs. John
Hooker, Mrs. Samuel
Hyde, Mrs. Clarence R.
Jameson, Mrs. P. C.
Jameson, Miss Jeanneta C.
Lathrop, Mrs. John H.
Lay, Mrs. Charles Downing
Littlejohn, Mrs. Thos. B.
Lloyd, Mrs. T. Mortimer
Lord, Mrs. John Bradley
Lyman, Mrs. Frank
Maynard, Mrs. E. P.
Morgan, Mrs. James L.
Morgan, Mrs. John Hill
Morse, Miss Alice L.
Notman, Mrs. George
Peters, Mrs. Sterling
Pierrepont, Miss Julia J.
Post, Miss Tessie W.
Pratt, Mrs. Frederic B.
Prince, Mrs. Benjamin
Putnam, Mrs. William A.
Roberts, Mrs. Dudley
Sargent, Mrs. W. D.
Smith, Mrs. Hugh M.
Stewart, Mrs. Seth Thayer
Stoughton, Miss Elizabeth C.
Stutzer, Mrs. Herman
Sutphin, Mrs. Joseph H.
Swan, Mrs. Eugene L.
Truslow, Mrs. Walter
Underhill, Mrs. John Garrett
Underwood, Mrs. John
Van Sinderen, Mrs. Adrian
White, Mrs. A. M.
White, Miss Harriet H.

LIST OF MEMBERS

(Revised to March 24, 1925)

For information concerning the various classes of membership consult page iii of this report.

Benefactors

By contribution of $100,000 or more, or by gifts of equivalent value

*Samuel P. Avery
*Augustus Graham
*A. Augustus Healy
*Carll H. de Silver
*Alfred T. White
*Robert B. Woodward

Patrons

By contribution of $25,000 or more, or by gifts of equivalent value

*Samuel P. Avery
*Mary Benson
*Edward L. Graef
Frank S. Jones
*Alfred Duane Pell
*Mrs. Caroline H. Polhemus
William A. Putnam
*Charles A. Schieren
*Alfred T. White
Miss Frances E. White
Miss Harriet H. White

Donors

By contribution of $10,000 or more, or by gifts of equivalent value

*Abraham Abraham
Frank L. Babbott
*Henry Batterman
*James A. H. Bell
*Miss Mary Benson
*Mrs. Eugene G. Blackford
*William Calverly
*William H. Cary
*Edward L. Graef
*George A. Hearn
*Joseph C. Hoagland
*Samuel N. Hoyt
Mrs. Joseph H. Lester
*Frederick Loeser
Mrs. Ian MacDonald
*Matilda McLean
*Henry P. Martin
*Joseph T. Perkins
*Mrs. Caroline H. Polhemus
George D. Pratt
William A. Putnam
*Henry K. Sheldon
Herman Stutzer

Permanent Members

By contribution of $2,500 or more, or by gifts of equivalent value

Abraham, Mrs. Abraham
Babbott, Frank L.
Barclay, Mrs. Reginald
Barnes, Mrs. Richard S.
Barr, Mrs. Thos. T.
Beers, E. LeGrand
Beers, Mrs. Mary L.
Beers, Miss M. Elizabeth
Beers, Dr. Nathan T.
Benedict, Henry H.
Blum, Edward C.
Boocock, Murray
Boody, Hon. David A.
Brackett, Miss Mary A.
Brown, Mrs. Lilla
Campbell, Miss Mary
Coffin, Mrs. Sturgis
Cook, Henry F.
Day, Mrs. Emily L.
Dutcher, Mrs. Helvetia B.
English, Mrs. J. Radford
Evans, Miss Mabel Louise
Fahys, George E.
First Unitarian Congregational Society of Brooklyn
Freifeld, Mrs. George
Godfrey, Mrs. Edwin D.
Good, Mrs. John
Hentz, Henry
Higgins, Charles M.
Hoagland, Mrs. Jos. C.
Hoagland, Raymond
Hoagland, Miss S. W.
Hodenpyl, Eugene, Jr.
How, Miss Susan B.
Hoyt, Mrs. Mark
Jones, Frank S.
Lawrence, Lysander W.
Lawrence, Richard H.
Lord, Mrs. John Bradley
Low, Mrs. A. A.
McMahon, Jos. T.
MacDonald, Mrs. Ian
Maxwell, J. Rogers
Morse, Horace J.
Oakley, Mrs. Theodora L.
Olcott, George M.
Peabody, George Foster
[1] Pell, Rev. Alfred Duane
Pell, Mrs. Cornelia L.
Post, James H.
Powell, Mrs. Robert E.
Pratt, George D.
Putnam, Wm. A.

* Deceased.

[1] Deceased, March 6, 1924.

Sanger, William Cary
Sanger, William Cary, Jr.
Seamans, Miss Dorothy
Simons, Mrs. William R.
Smith, Mrs. Annie Morrill
Smith, Howard C.
Stutzer, Herman
Underwood, John T.
Vander Weyde, Mrs. N. J.
Walsh, Mrs. Anna F.
Webster, Mrs. Mary L.
White, Alexander M.
White, Miss Frances E.
White, Miss Harriet H.

Life Members

By contribution of $500 or more, or by gifts of equivalent value

(Through the Botanic Garden)

Babbott, Frank L.
Bailey, Frank
Cary, Mrs. Wm. H.
Childs, Eversley
Frothingham, Miss Elisabeth
Frothingham, John W.
Hicks, Henry
Loines, Miss Hilda
Potts, Maj. C. E.
Pratt, Charles M.
Spalding, Mrs. Mary Bates
Smith, Mrs. Annie Morrill
Southwick, Dr. E. B.

(Through other Departments of the Institute)

Abraham, Lawrence E.
Achelis, Fritz
Adams, Mrs. Edward
Ager, John W.
Albertson, Rev. C. C.
Allan, Mrs. Mansfield
Allen, Miss Mary W.
Anderson, Mrs. John
Andrews, William A.
Appleton, R. Ross
Arnold, Miss Mary
Ayers, Dr. Messenger
Babbott, Dr. Frank L., Jr.
Banbury, James Joseph
Bannister, Miss E. C.
Batterman, Charles H.
Batterman, Henry L.
Batterman, Miss M. P.
Baxter, F. W.
Baylis, A. B.
Baylis, Wm., Jr.
Betts, Mrs. Lillian W.
Bigelow, Edward F.
Blumenthal, Maurice
Blydenburgh, Frank J.
Bolwell, Mrs. Sarah A.
Boody, Alvin
Bouck, James B.
Bowker, R. R.
Bramm, Miss Elizabeth
Brasher, Philip
Brasher, Reginald R.
Brockway, Miss E. A.
Brown, Miss A. W.
Brown, John W.
Brush, Dr. George W.
Buckley, Charles R.
Buckley, John D.
Buek, Mrs. Cecilia
Burnham, Dr. Clark
Cadman, Rev. S. Parks
Campbell, Mrs. Wm. Mitchell
Cary, Miss Alice B.
Cary, Isaac H.
Chapel, Miss Gertrude
Chapel, William L.
Chapman, Miss Leila H.
Chapman, Mrs. Leila T.
Chauncey, Rev. E. F.
Childs, William H.

Chittenden, Miss A. H.
Claflin, John
Clarke, Rev. L. Mason
Colyer, Jr., Mrs. Joseph H.
Corlies, Howard
Courtney, Wm. C.
Crane, Judge Frederick E.
Crittenden, Walter H.
Crowell, Mrs. Jeremiah
Cullen, Miss Margaret M.
Cunningham, Mrs. F. W.
Curtis, Henry S.
Dalby, Archibald B.
Davenport, Hon. Wm. B.
Davenport, Mrs. Wm. B.
Davis, William T.
De Motte, G. C.
Denbigh, John H.
Dennis, Dr. Frederick S.
Dennis, Mrs. Fred. S.
Dettmer, Hon. Jacob G.
Dick, J. Henry
Dixon, Theodore P.
Dodge, Cleveland H.
Dodge, Miss S. Ross
Dougherty, Andrew, Jr.
Dougherty, Edward J.
Draper, Ernest G.
Dreier, Theodore
Dykeman, Conrad V.
Eastman, Mrs. Wm. F.
Eger, Mrs. Theodore G.
Elmhirst, Mrs. Dorothy P. Whitney
English, George L.
Fahnestock, Gates D.
Fairchild, Julian D.
Fara Forni, Mme. A. F.
Farmer, Walter B.
Farrell, James A.
Farrier, Albert Moses
Farrier, Frederick B.
Ferrier, Miss E. A.
Field, Miss M. Elizabeth
Fish, Mrs. Ivy Chapel
Flagg, Mrs. Montague
Flinsch, Rudolph E. R.
Foote, Alfred Sherman
Francis, Mrs. Lewis W.
Frank, Mrs. George S.
Frazier, Kenneth
Frothingham, Elizabeth W.
Frothingham, Miss H. H.
Frothingham, John W.
Gibb, William T.
Gifford, Ira L.
Gilbert, Miss A. Louise M.
Gilbert, William T.
Good, Mrs. John
Good, Mrs. Wm. H.
Goodnow, David F.
Goodnow, Prof. F. J.
Goodnow, Henry R.
Goodnow, Weston W.
Grace Church
Rev. Francis Little
Guild, Miss Mary A.
Hall, Charles H.
Halsey, William B.
Ham, Miss Dorothy B.
Harriman, Mrs. E. H.
Hathaway, Charles
Healy, Mrs. A. Augustus
Healy, Henry W.
Heckscher, August
Hester, Mrs. Ada Gibb
Hicks, Henry
Hill, William B.
Hoagland, Miss Anna M.
Hoagland, Miss Ella J.
Hollenback, Miss A. B.
Hooker, D.
Hooper, Mrs. Franklin W.
Hornaday, William T.
Horsman, Edward I.
Howe, Mrs. Sarah P.
Howell, Hampton
Hubbell, Rev. Wm. S.
Huber, Joseph
Hudson, Mrs. Laura K.
Hulbert, Mrs. Henry C.
Hulst, Mrs. M. H. S.
Husson, Miss C. Julie
Hyde, Henry St. John
Hyde, James H.

Ingraham, Miss Frances
Ingraham, George S.
James, Dr. Walter B.
Jeffrey, Dr. Stewart L.
Jenkins, Alfred W.
Jennings, Walter
Johnson, Alvan R.
Jones, Miss Emily W.
Joost, Mrs. Martin
Kahn, Mrs. Otto
Kelekian, Dikran G.
Kellogg, Dwight H.
Kennedy, Hon. Elijah R.
Kennedy, Mrs. Mary A.
Kenyon, Mrs. Irene S.
Kenyon, Whitman W.
Kenyon, W. W., Jr.
King, Frank T.
Kunz, George F.
Ladd, Mrs. Wm. Sargeant
Lamb, Col. Albert E.
Lang, Mrs. Robert
Latimer, Miss Julia W.
Lewis, Mrs. August
Lewisohn, Adolph
Lincoln, Mrs. Dorothy Chapel
Litchfield, E. Hubert
Litchfield, Edward H.
Litchfield, Ed. H., Jr.
Littlejohn, Mrs. Thos. B.
Lockwood, Luke Vincent
Loeser, Charles
Loeser, Gustav
Love, Mrs. Henry D.
Low, Ethelbert Ide
Low, Josiah O.
Lowber, Miss Ida E.
Ludlum, Clinton W.
Lyman, Frank
Lynde, Mrs. Martha R.
McAneny, Hon. George
McCarty, Rt. Rev. Ed.
McConnell, Rev. S. D.
McDonald, Rev. Robert
McKay, Mrs. John S.
Macbeth, Robert W.
Marshall, Wm. W.
Mason, William P.
Matheson, William J.
Mathews, Mrs. Albert H.
Maxwell, Henry L.
Maynard, Edwin P.
Mead, W. S. M.
Melish, Rev. John H.
Mercer, Rev. Arthur
Merwin, Miss Mary A.
Moffat, David
Moffat, William L., Jr.
Mollenhauer, J. Adolph
Moore, Mrs. W. H.
Morgan, James L., Jr.
Morgan, John Hill
Morse, Miss Alice L.
Morse, Charles L.
Mundhenk, Herman
Nichols, William H.
Nostrand, P. Elbert
O'Connor, Mrs. W. B.
Ogilvie, Donald Manson
Olcott, Miss Martha W.
Orr, Miss Mary Moore
Otis, Miss Lillian L.
Packard, Miss Mary S.
Palmer, Henry L.
Parker, Jr., Asa W.
Parker, Gordon
Peet, Mrs. Louise H.
Pierrepont, John J.
Pierrepont, Seth Low
Polhemus, Miss R. A.
Potts, Charles E.
Pratt, Mrs. Frederic B.
Pratt, Frederic B.
Pratt, Harold I.
Prentice, James Howard
Prentiss, Russell E.
Prosser, Thomas
Prosser, Thos. Harold
Prosser, Walter R.
Putnam, Harrington
Putnam, Mrs. Wm. A.
Quick, Henry L.
Ramsay, Dick S.
Ramsdell, Mrs. F. Van N

Rice, Mrs. Chas. E.
Robinson, George C.
Robinson, Dr. Nathaniel
Ruger, Mrs. Adolph
Ruland, Irving A.
Ruscoe, Miss Rose
Russell, Rev. James T.
Russell, James T., Jr.
Russell, Mrs. Talcott H.
Sackett, Charles A.
Sanbern, Mrs. Frank H.
Sanger, Miss Lillian
Schenck, Miss Eunice M.
Schieren, Harrie Victor
Sheldon, Mrs. Anna B.
Sheldon, Henry
Shevlin, James
Slack, Mrs. Julia G.
Sloan, Francis H.
Smith, G. Foster
Smith, Mrs. Katherine L.
Smith, Theo. E.
Snow, Helmer
Spalding, Mrs. Mary Bates
Squier, Frank
Steele, Sanford H.
Stevens, Mrs. Roy G.
Stevens, Shepard
Stewart, Dr. D. McC.
Stokes, Mrs. S. Emlen
Sullivan, Andrew T.
Taylor, Miss Besse
Taylor, William H.
Thayer, Mrs. Anna K.
Tiffany, Louis C.
Tucker, Mrs. Geo. S., Jr.
Turner, Mrs. Bertha C.
Tuthill, Miss Isabel H.
Valentine, P. A.
Van Anden, Miss S. M.
Van Nostrand, Mrs. J. B
Van Sinderen, Mrs. A.
Van Sinderen, Adrian
Van Wyck, Richard
Von Francken Sierstorpff, Countess
Wagner, Miss Marie
Waldbridge, Robert R.
Walsh, William W.
Warbasse, Mrs. James P.
Ward, Miss Helen
Warner, Dr. Edwin G.
Weber, Mrs. Herman C.
Webster, Mrs. Ed. H.
Webster, R. P. S.
White, Harold T.
White, S. V., Jr.
White, Wm. Augustus
Whitney, Sumner B.
Williams, Col. Tim. S.
Wisner, Mrs. Horatio S.
Woodward, Miss Mary B.
Young, Richard
Zabriskie, Mrs. Cornelius
Ziegler, Mrs. William

Sustaining Members [1]

By payment of $25 annually

Anderson, John (B)
Baird, Robert B. (M)
Blackman, Dr. Leonard (M)
Brooks, Mrs. Edward B. (B)
Bush, Irving T. (M)
Campbell, Miss Mary (M)
Case, Miss Marian Roby (B)
Crampton, Mrs. Edwin H. (B)
Doscher, Mrs. Alice B. (M)
Edwards, Mrs. Wm. Seymour (M)
Enequist, John (B)
Faber, L. W. (M)
Fish, Harold L. (M)
Ford, James B. (B)

[1] (B) Through the Botanic Garden; (M) Museum; (E) Educational Department.

Foster, Charles L. (M)
Froeb, Charles (M)
Frothingham, John W. (M)
Frothingham, Mrs. J. S. (M)
Good, Mrs. Wm. Howard (M)
Graves, Robert N. (M)
Hammond, C. S. (M)
Havemeyer, T. A. (B)
Ingraham, Mrs. Henry C. M. (B)
Jones, Harry L. (M)
Joost, Mrs. Martin (B)
Kirkman, Mrs. A. S. (M)
Lambert, Frank (M)
Latimer, Miss Mary (B)
Lawrence, L. W. (B)
Leech, Mrs. John E. (B)
Liebman, Julius (M)
Logan, William J. (E)
Longman, Walter (M)
Loomis, Guy (M)
Low, Mrs. Chauncey E. (M)
Low, William G. (M)
Luther, Mrs. George M. (B)
Munson, Frank C. (M)
Notman, George (B)
Notman, Howard (E)
Parkhurst, Mrs. H. L. (B)
Perkins, Mrs. Grace P. (E)
Pierrepont, Miss Julia J. (M)
Pinkerton, Mrs. Robert A. (E)
Redfield, W. C. (M)
Righter, Miss Jessie H. (M)
Rouss, P. W. (E)
See, Alonzo B. (B)
Somers, Harold (M)
Squibb, Dr. Edward H. (E)
Sutphin, Mrs. Jos. H. (M)
Van Norden, Howard L. (M)
White, Alexander M. (B)
Wood, Miss Emily S. (E)
Zabriskie, Mrs. C. (B)

Brooklyn Botanic Garden Annual Members

By payment of $1c annually

Abraham, Meyer
Adams, Miss Alice
Adams, Mrs. Horatio M.
Albers, Dr. Frederick M.
Almirall, Mrs. Juan A.
Altieri, Joseph
Anderson, Mrs. John
Arms, Mrs. John Taylor
Ashton, Wendel G.
Augur, W. A.
Austin, Robert B.
Avery, Walter
Bachrach, H. S.
Bailey, Mrs. A. W.
Bailey, Mrs. DeWitt
Bailey, Mrs. Frank
Bangs, C. Roy
Banker, John F.
Barclay, Ralph G.
Baris, Joseph H.
Barnett, Bernard D.
Beatty, Dr. George Wesley
Beers, John Frank
Behman, Miss Marguerite
Behr, Edward A.
Belgard, Harry
Bell, Jacob
Berg, Simon
Berkowitz, Dr. Maxwell
Berlin, Dr. Louis
Bernstein, A. N.
Berri, Mrs. Ethel P.
Betsch, William G. L.
Bixby, Willard G.
Blackman, Dr. William W.
Bohm, Albert
Bossert, John
Bossert, Mrs. L.
Brackett, Miss Mary A.
Braman, Miss Irene M.
Britton, Dr. N. L.
Broadwin, Selig

Brower, Ernest C.
Browning, Dr. William
Bruning, Dr. Henry F.
Bryan, Mrs. Jane S.
Buchanan, Mrs. S. Edwin
Buchman, A. I.
Buerkle, W. A.
Burkard, Dr. George
Burrell, F. A. M.
Busch, G. F.
Butterick, Miss Mary E.
Buxbaum, Isadore
Cahoone, Richards M.
Cahoone, Mrs. Richards M.
Campbell, Miss Mary
Cary, Isaac H.
Cary, Spencer C.
Cary, Mrs. William H.
Chanin, Irwin S.
Child, Dr. Augustus L.
Childs, Mrs. Harry E.
Church, Frederick J.
Cisney, Thomas E.
Clapp, Mrs. A. P.
Clark, John J.
Clark, Dr. Raymond
Cochenour, J. F. D.
Cole, Mrs. Chester W.
Cooper, Mrs. Marin Le Brun
Costello, Rev. Wm. J.
Cranford, Frederick L.
Crawbuck, George W.
Cronemeyer, Charles
Crosby, C. W.
Currie, Mme. Isadora
Cutter, Ralph L.
D'Alboro, Dr. John B.
Dalzell, Edward T.
Dangler, Mrs. George Jacob
Dangler, William
Darrow, Dr. Fred. L.
Davenport, Mrs. Henry Benedict
Davenport, Mrs. Henry J.
Davis, Mrs. Thomas J., Jr.
Davol, Mrs. F. H.
Deininger, Mrs. Grace
Delafield, Mrs. John R.
Delatour, Dr. H. Beeckman
Deneke, Mrs. Elizabeth
De Silver, Mrs. Albert
Despotas, George
De Waltoff, Dr. D. B.
Deutschmann, Mrs. E. A.
Dichert, Mrs. Beula M.
Dietz, Nicholas
Diller, Mrs. Frank J. W.
Ditore, Michael
Doane, Albert C.
Dorfman, W. Boris
Dorney, Dr. Edw. R.
Dreier, Mrs. H. Edward
Dressler, George
Driggs, Miss Alice A.
Dudley, Percy S.
Dudley, Mrs. William B.
Dunbar, Dr. Alex. E.
du Pont, Mrs. T. Coleman
Duryea, Stephen F.
DuVal, Guy
DuVal, Mrs. Guy
Dwyer, Dr. H. Shirley
Earle, Mrs. Wm. P., Jr.
Eastlund, Rev. John
Ebbets, Charles H.
Eckstein, Harry
Edelman, Samuel
Eichler, William
Fairbanks, Maria B.
Fairchild, B. T.
Feldman, Dr. Max
Feldstein, Dr. Samuel
Ferguson, William C.
Fettes, Dr. David S.
Field, Mrs. William D. C.
Fishberg, Dr. Mark
Flecher, John
Forestiere, Charles
Fox, Dr. Harold R.
Fox, Herman
Frank, Ernest
Freed, Alexander S.
Friedman, Solomon
Froeb, Herman
Fruchtbaum, Dr. L. M.

Fuchs, Dr. Carl F.
Fulle, John H.
Funk, Dr. Merton L.
Gans, Marion S.
Gewertz, M. Milton
Giantieri, Dr. Victor
Giblin, Wm. J.
Gill, Wm. H.
Gilvarry, James H.
Given, Dr. J. B., Sr.
Gladding, Walter M.
Gleason, Marshall W.
Gleitz, Mrs. Frank
Goell, Mrs. Charles
Goell, Jacob
Goetze, Mrs. Otto
Goldberg, David
Gollmar, Hugo C.
Goodstein, Mark
Gorodess, Michael
Gottesman, Sidney M.
Gottlieb, Leon
Gough, Dr. F. A.
Greenberg, Dr. Sarah K.
Grotewohl, Martin
Gunnison, Mrs. Raymond M.
Hadden, Crowell
Hahn, Mrs. R. C.
Halstead, Mrs. J. Morton
Halsted, Mrs. Henry M.
Hamel, Blanche D.
Hargitt, Dr. Chas. A.
Harringan, W. W.
Harris, Dr. Albert
Harrison, Miss Katherine I.
Hasenflug, August
Haskell, Paul C.
Haskins, Mrs. Edward W.
Haughton, Richard
Healy, Henry
Heller, Jacob
Hence, Mrs. Sarah Kyle
Henry, Wm. A.
Herman, Dr. David S.
Herriman, Dr. Rudolph F.
Herrity, Dr. Geo. F.
Hetkin, Henry
Higgins, Dr. Alice K.
Higgins, Charles M.
Hill, Lester W.
Hills, Mrs. James Mandly
Hills, Mrs. John
Hirsch, Dr. John
Hirschberg, Benjamin
Hitlin, Dr. Alexander
Hofer, Gustav J.
Holden, Dr. T. N.
Hollander, Frederick
Hollenback, Miss Amelia B.
Hoogland, John W.
Hooker, Dr. Samuel C.
Hooker, Mrs. Samuel C.
Hopkins, Jesse L.
Horney, Dr. Edward
Horrocks, Mrs. Edward E.
Horstein, Solomon
Horton, George S.
Horwill, Mrs. Edward T.
Howell, William R.
Hudtwalker, George W.
Hume, Mrs. Henry M.
Humstone, Walter C.
Ibbotson, Henry C.
Ide, Mrs. Charles W.
Ingersoll, Mrs. Raymond V.
Ittner, Wm. F.
Jackson, Edward
Jacobs, Dr. Frederick M.
Jaffe, A. L.
Jantzer, George E.
Jennings, Miss Annie B.
Jennings, Dr. Frank D.
Jennings, Dr. John E.
Joachim, Dr. Henry
Johnson, Dr. Louis C.
Johnston, Dr. Evan M.
Jonas, Ralph
Jones, Miss Helen Swift
Jordy, Dr. George R.
Judge, Jas. P.
Kane, Mrs. DeLancey
Kant, Wm. H.
Karle, John L.
Kasper, Dr. Gerard

Kaufman, Dr. Benjamin
Kayfetz, Isidore
Kelly, William J.
Kellner, Samuel
Kelsey, Wm. H.
Kennedy, Hon. E. R.
Ketcham, Herbert T.
King, F. T.
Kinsey, Henry R.
Kleinteich, George
Kliatshco, Dr. H. G.
Kuehnle, Charles H.
Lafrentz, F. W.
Lang, Frank
Langdon, Palmer H.
Lange, Dr. Hugo
Lathrop, Mrs. John H.
Lazarus, Dr. Geo. F.
Lechner, Fred.
Lee, Prof. Frederic S.
Lee, Dr. Marguerite T.
Leeming, Mrs. Thomas L.
Lehrman, Jacob
Leibowitz, Dr. Philip
Lenges, Philip
Lesnick, Dr. Henry S.
Levine, Dr. William
Levy, Samuel M.
Lewin, Dr. Samuel A.
Lewis, Dr. M. T.
Lewisohn, Adolph
Liebman, Mrs. Julius
Littlejohn, Mrs. Thomas B.
Loines, Mrs. Stephen
Lomax, John J.
Longo, Michael F.
Longstreet, Florence E.
Louria, Dr. Henry W.
Love, Mrs. Cornelius R.
Love, John H.
Low, Miss Emma C.
Low, Josiah O.
Low, Mrs. Walter Carroll
Lyman, Frank
Lyons, Edward
McAteer, Dr. D. A.
McEvoy, Thomas J.
McKelway, Mrs. St. Clair
McLanahan, Mrs. Scott
MacLean, Mrs. Peter A.
Mangieri, George A.
Manker, Frank
Mantell, John
Marel, Dr. A. H.
Marino, Dr. A. W. Martin
Marino, Dr. Francesco
Mark, Jacob
Marshall, Mrs. William W.
Martin, Mrs. Delmer Duncan
Masone, Charles J.
Maxwell, Earl C.
May, Hudson
Mead, D. Irving
Mellen, Mrs. Arthur W.
Melvin, Mrs. Jennie
Merritt, Mrs. James Haviland
Metcalf, Mrs. Charles Peabody
Meyer, Frederick J.
Meyer, Henry
Meyer, Max C.
Miller, C. G.
Moonia, Louis
Moore, John W.
Morgan, Miss Charlotte E.
Morse, Miss Alice L.
Moult, Mrs. John F.
Muller, Adolf
Munson, Mrs. W. D.
Nesmith, Miss Charlotte
Nevin, Harris
Newman, Miss Grace
Newman, Miss Louise M.
Nicholls, William H.
North Jr., N. L.
Notman, Mrs. George
Nova, Algernon I.
Obermayer, Charles J.
Ohly, Dr. John H.
Ovington, Charles K.
Paffard, Dr. Frederic C.
Parrish, Dr. Jno. W.
Parsons, Frank H.
Peckham, Mrs. Wheeler
Pendleton, Frederick S.

Penny, J. H.
Peterson, Andrew
Pierce, Mrs. C. T.
Pierrepont, Miss Anna J.
Pierrepont, Miss J. J.
Pisciotta, Dr. Joseph
Poggenburg, Robert H.
Pomeroy, Dr. Ralph H.
Pounds, Lewis H.
Pratt, Frederic B.
Pratt, Harold I.
Pratt, Mrs. K. Sloan
Pratt, Mrs. Richardson
Price, Abraham
Prince, J. Lloyd
Prosser, Thomas
Prosser, Mrs. Thomas
Purdy, Miss Maud H.
Pyle, H. T.
Ramsay, Dick S.
Redfield, Hon. William C.
Reimer, Miss Margareth B.
Reimer, Mrs. Rudolph
Rentrop, Mrs. Bernard
Ris, Mrs. Bernard
Robbins, Miss Serena
Rogers, Mrs. John R.
Ronfeldt, Charles J.
Rosenberg, P. F.
Rowe, Mrs. Frederick W.
Rushmore, Dr. Jacques C.
Rynd, Dr. C. E.
Satterlee, Mrs. Herbert L.
Schlein, Dr. Julius
Schloh, Henry L.
Schlossberg, A.
Schmerzler, Henry
Searle, Mrs. William S.
Seaver, Benj. F.
Shaw, Robt. Alfred
Sherwood, Mrs. John Lyman
Sloan, Mrs. Russell R.
Smallheiser, Miss Lee
Smiley, Daniel
Smith, B. Herbert
Smith, Mrs. Annie Morrill
Smith, G. Foster
Smith, James A.
Smith, Theodore E.
Somers, Arthur S.
Southard, Miss Edith Brett
Staber, Maud J.
Stanley, A. W.
Steinbrink, Meier
Stellwagen, Fred. L.
Stewart, Mrs. Seth Thayer
Stickle, Chas. W.
Stoughton, Miss E. C.
Streit, Lewis A.
Swan, Frank C.
Talmage, Mrs. John F.
Taylor, Ronald
Thayer, Mrs. John Van Buren
Thompson, William Boyce
Tiebout, Cornelius H., Jr.
Trommer, Geo. F.
Twyeffort, Miss Nellie
Tyrrell, Dr. G. W.
Uhrbrock, Mrs. E. F.
Underhill, Mrs. John Garrett
Valentine, Stephen
VanBrunt, Jeremiah R.
Vanderbilt, Mrs. R. T.
Van Sinderen, Adrian
Van Sinderen, Mrs. Adrian
Van Sinderen, Henry B.
Walton, Mrs. John J.
White, William Augustus
Wolfson, Mrs. M. S.
Woodward, Miss Mary Blackburne
Young, Mrs. Charles T.
Zimmele, Charles F.

The Brooklyn Institute of Arts and Sciences

Officers of the Board of Trustees

President
FRANK L. BABBOTT

First Vice-President
WALTER H. CRITTENDEN

Second Vice-President
EDWARD C. BLUM

Third Vice-President
WILLIAM A. PUTNAM

Treasurer
A. FOSTER SMITH

Secretary
JOHN H. DENBIGH

Botanic Garden Governing Committee

FRANK BAILEY, *Chairman*

FRANK L. BABBOTT, *Ex-officio*	JOHN W. FROTHINGHAM
MRS. WILLIAM H. CARY	MISS HILDA LOINES
WALTER H. CRITTENDEN	EDWIN P. MAYNARD
GATES D. BAHNESTOCK	WILLIAM A. PUTNAM
MRS. LEWIS W. FRANCIS	ALEXANDER M. WHITE

Ex Officio Members of the Board

THE MAYOR OF THE CITY OF NEW YORK
THE PRESIDENT OF THE BOROUGH OF BROOKLYN
THE COMMISSIONER OF PARKS, BOROUGH OF BROOKLYN

GENERAL INFORMATION

Membership.—All persons who are interested in the objects and maintenance of the Brooklyn Botanic Garden are eligible to membership. Members enjoy special privileges. Annual Membership, $10 yearly; Sustaining Membership, $25 yearly; Life Membership, $100. Full information concerning membership may be had by addressing *The Director, Brooklyn Botanic Garden, Brooklyn, N. Y.* Telephone, 6173 Prospect.

The Botanic Garden is open free to the public daily from 8 a.m. until dark; on Sundays and Holidays open at 10 a.m.

Entrances.—On Flatbush Avenue, near Empire Boulevard (Malbone Street), and near Mt. Prospect Reservoir; on Washington Avenue, south of Eastern Parkway and near Empire Boulevard; on Eastern Parkway, west of the Museum Building.

The street entrance to the Laboratory Building is at 1000 Washington Avenue, opposite Montgomery Street.

To Assist Members and others in studying the collections the services of a docent may be obtained. This service is free of charge to *members of the Botanic Garden*; to others there is a charge of 50 cents per person. Arrangements must be made by application to the Curator of Public Instruction at least one week in advance. No parties of less than six adults will be conducted.

To Reach the Garden take Broadway (B.M.T.) Subway to Prospect Park station; Interborough Subway to Eastern Parkway-Brooklyn Museum Station, Flatbush Avenue trolley to Empire Boulevard; Franklin Avenue, Lorimer Street, and Tompkins Avenue trolleys to Washington Avenue; St. John's Place trolley to Sterling Place and Washington Avenue; Union Street and Vanderbilt Avenue trolleys to Prospect Park Plaza and Union Street.

PUBLICATIONS
OF THE
BROOKLYN BOTANIC GARDEN

RECORD. Established, January, 1912. An administrative periodical issued quarterly. Contains, among other things, the *Annual Report* of the director and heads of departments, special reports, announcements of courses of instruction, miscellaneous papers, and notes concerning Garden progress and events. Free to members of the Garden. To others one dollar a year; 25 cents a copy.

MEMOIRS. Established, July, 1918. Published irregularly.

Volume I, *Dedication Papers:* comprising scientific papers presented at the dedication of the laboratory building and plant houses, April 19-21, 1917. Price $3.50, plus postage.

Volume II. The vegetation of Long Island. Part I, The vegetation of Montauk: A study of grassland and forest. Price $1.00, plus postage.

CONTRIBUTIONS. Established, April 1, 1911. Papers originally published in periodicals, reissued as "separates," without change of paging, and numbered consecutively. This series includes occasional papers, as well as those embodying the results of research done at the Garden, or by members of its staff or students. Twenty-five numbers constitute one volume. Price 25 cents each, $5.00 a volume.

36. *Influence of environmental factors on the infection of Sorghums and Oats by smuts. I. Experiments with covered and loose kernel smuts of Sorghum.* 17 pages, 7 figures. 1924.

37. *Influence of environmental factors on the infection of sorghums and oats by smuts. II. Experiments with covered smut of oats and general considerations.* 21 pages, 3 plates. 1924.

38. *Physiologic races of oat smuts.* 10 pages, 3 plates. 1924.

40. *Physiological specialization of Ustilago hordei.* 21 pages, 1 figure. 1924.

41. *Factors influencing the infection of wheat by Tilletia Tritici and Tilletia laevis.* 24 pages, 4 plates. 1924.

42. *Variation among the sporelings of a fertile spore of the Boston fern.* 27 pages, 15 figures. 1924.

44. *Modes of infection of Sorghums by loose kernel smut.* 17 pages, 3 plates. 1925.

LEAFLETS. Established, April 10, 1913. Published weekly or biweekly during April, May, June, September, and October. The purpose of the *Leaflets* is primarily to give announcements concerning flowering and other plant activities to be seen in the Garden near the date of issue, and to give popular, elementary information about plant life for teachers and others. Free to members of the Garden. To others, fifty cents a series. Single numbers 5 cents each.

GUIDES to the collections, buildings, and grounds. Price based upon cost of publication.

SEED LIST. Established, December, 1914. Since 1923 issued each year in the January number of the RECORD.

AMERICAN JOURNAL OF BOTANY. Established, January, 1914. Published, in coöperation with the BOTANICAL SOCIETY OF AMERICA, monthly, except during August and September. Subscription, $6.00 a year.

ECOLOGY. Established, January, 1920. Published quarterly in coöperation with the ECOLOGICAL SOCIETY OF AMERICA. Subscription, $4.00 a year.

GENETICS. Established, January, 1916. Bi-monthly. Subscription, $6.00 a year.

BROOKLYN BOTANIC GARDEN RECORD

VOL. XIV JULY, 1925 No. 3

EDITED BY
C. STUART GAGER

CONTENTS

	PAGE
The Test Garden for Beardless Irises	115
Eleventh Annual Spring Inspection	119
Tree Planting by Girl Scouts	120
Notes	121

PUBLISHED QUARTERLY
AT LANCASTER, PA.

BY THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES

Entered as second-class matter in the Post-office at Lancaster, Pa., under Act of August 24, 1912.

BROOKLYN BOTANIC GARDEN

Scientific, Educational, and Administrative Officers

SCIENTIFIC AND EDUCATIONAL

The Staff*

C. STUART GAGER, Ph.D., Sc.D., Pd.D., *Director*
MONTAGUE FREE, *Horticulturist*
ARTHUR HARMOUNT GRAVES, Ph.D., *Curator of Public Instruction*
ALFRED GUNDERSEN, Docteur de l'Université (Paris), *Curator of Plants*
ELSIE TWEMLOW HAMMOND, M.A., *Assistant Curator of Elementary Instruction*
GEORGE M. REED, Ph.D., *Curator of Plant Pathology*
ELLEN EDDY SHAW, B.S., *Curator of Elementary Instruction*
RAY SIMPSON, *Librarian*
NORMAN TAYLOR, *Curator of Plants and Plantations*
ORLAND E. WHITE, Sc.D., *Curator of Plant Breeding and Economic Plants*

Other Officers

MARY AVERILL, *Honorary Curator of Japanese Gardening and Floral Art*
HAROLD A. CAPARN, *Consulting Landscape Architect*

RALPH CURTISS BENEDICT, Ph.D., *Resident Investigator*

MAUDE L. HICKOK, *Instructor*
LAURA ALMA KOLK, M.A., *Research Assistant*
DOROTHY I. NEFF, A.B., *Research Assistant*
MABEL E. TURNER, B.S., *Instructor*

EDITH R. DALY, *Library Assistant*
MARGARET R. ELLIS, *Curatorial Assistant*
HELEN SMITH HILL, *Curatorial Assistant*
LOIS DAVIS VAN GORDEN, *Curatorial Assistant*
CHARLOTTE S. YOUNG, A.B., *Curatorial Assistant*

ADMINISTRATIVE

DANIEL C. DOWNS, *Secretary and Accountant*
MAUDE E. VORIS, *Assistant Secretary*
MARION S. GIBBS, *Business Office Assistant*

ANN C. OHLANDER, *Secretary to the Director*
FRANK STOLL, *Registrar and Custodian*
WILLIAM H. DURKIN, *Membership Secretary*

LAURA M. BREWSTER, *Stenographer*
ALVHILD LENNEA WIMAN, *Stenographer*

LOUIS BUHLE, *Photographer*

* The names are arranged alphabetically.

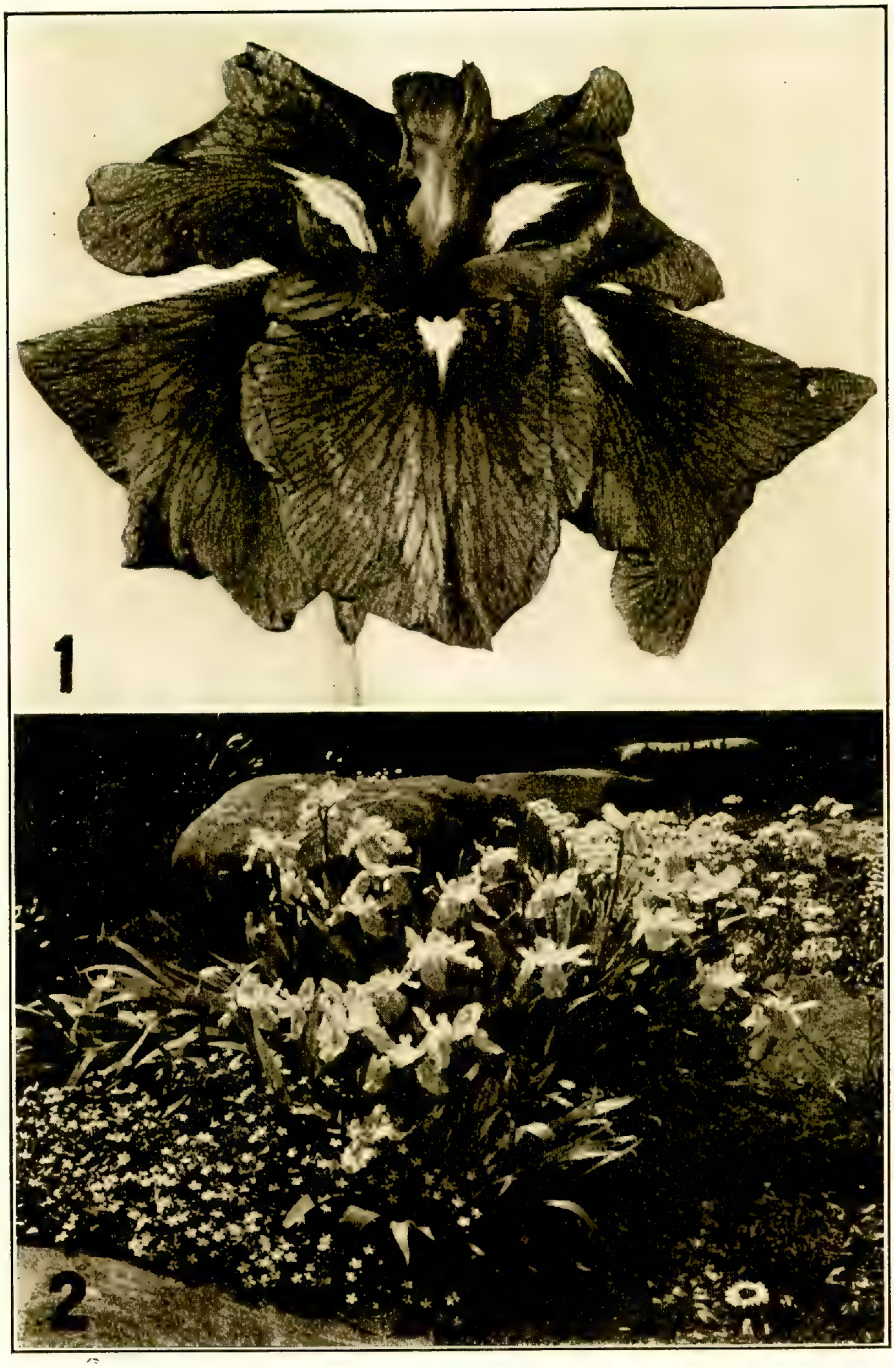


FIG. 11. 1. Double form of Japanese Iris; 2. Roof Iris of Japan (*Iris tectorum*) in Rock Garden of Brooklyn Botanic Garden.

BROOKLYN BOTANIC GARDEN RECORD

VOL. XIV JULY, 1925 NO. 3

THE TEST GARDEN FOR BEARDLESS IRISES

Arrangements were made with The American Iris Society in 1920 for the establishment of a test garden for the Beardless (Apogon) Irises at the Brooklyn Botanic Garden. The original plan contemplated primarily the study of the Japanese irises (*Iris kaempferi*), and a considerable number of varieties were sent to the Botanic Garden in 1920–21 by those interested in the project. As a matter of fact, however, little progress has been made in attacking the problems connected with this group of irises.

Doubtless the Bearded Irises are much more familiar as garden plants. Most people who have a flower garden possess one or more varieties of the bearded type. The larger gardens may contain varieties of dwarf bearded, intermediate bearded, and tall bearded. There are several varieties of dwarf and intermediate bearded, and the tall bearded are represented by a very large collection of varieties. During the past twenty-five years workers in England, France, Germany, and the United States have been very active in the development of new varieties, most of which belong to the tall bearded group.

The section of Beardless Irises, or the Apogons, is a large one and consists of several very distinct groups. They all differ from the bearded irises by the absence of the hairs, or beard, on the fall. Our native blue flag (*Iris versicolor*) which grows commonly in the swamps in eastern United States is a familiar example of a beardless iris. In some gardens we may find varieties derived from species of the Sibirian group, as *Iris sibirica* and *I. orientalis*. A much larger group, from the standpoint of the development of varieties, is the group of true Japanese irises derived from *Iris kaempferi*.

A renewed effort is now being made to effectively study the Apogon Irises, especially the Japanese, Sibirian, and Spurian

varieties. There are a number of things which need to be done, and a program with special reference to the Japanese varieties has been developed which if followed out may result in the solution of some of the problems.

1. *Identification of Varieties and Nomenclature.*—There is a great deal of confusion regarding the proper identification of varieties of Japanese irises. The same name has been applied to two or more different plants and also the same variety has been listed by different growers under different names. The original importations of these irises came from Japan, several being made independently by growers in Europe and America. A great deal of confusion in the nomenclature exists, and this is due in part to Japanese nurserymen sending out varieties incorrectly labeled; in part to the difficulty in spelling Japanese names; in part to the different translations of Japanese names; and finally the practice of renaming the Japanese varieties in Europe and America.

In order to properly identify the varieties and apply to them the correct name, it is necessary to get together and grow all named plants. It may then be possible, by means of the original published descriptions and illustrations, to correctly identify many of the original varieties. Previous to the fall of 1924, the Botanic Garden, through the cooperation of The American Iris Society, had assembled a collection of about eighty varieties, or rather that number of plants were received under the corresponding number of names. Last fall the Garden added about fifty different plants, many of these, however, under names already listed. During this spring approximately one hundred varieties have been imported from Europe. In addition, through the active cooperation of President John C. Wister of The American Iris Society, several American growers have sent a number of plants for growing in the Test Garden, over one hundred plants having been received.

When the collection has become fairly complete and the plants give vigorous bloom it may be possible to attain some accuracy in the identification of varieties. The preparation of an authentic check-list giving the correct spelling, meaning and application of names to definite varieties and the reduction to synonymy of the

large number of names which have been used will be of great value to growers of Japanese irises.

2. *Description and Illustrations of Varieties.*—A complete and accurate description of the true distinct varieties is highly desirable. The preparation of such a description can only be made from the living plants growing side by side. It may be desirable to establish distinct type varieties rather than to attempt to describe all the different ones which have been developed. The plants which show only minor variations may then be referred to the proper type variety.

In connection with the description it is highly desirable that accurate colored drawings of the real distinct varieties be prepared and made available for the grower of these forms. As the blooming period of the plants is comparatively short, only a few illustrations can be made in any one year. It is planned, however, to illustrate all type varieties, and it is expected that some time accurate descriptions, together with these illustrations, may be made available to the members of the Iris Society and others.

3. *Classification.*—The preparation of a convenient classification, based on color and other distinctive features, is highly desirable. This can only be done when we have a complete knowledge of the characteristics and identity of the varieties. It may be feasible to pass upon the merits of the different varieties and rank them in a similar fashion to the present ranking of the bearded irises. Here again, exact knowledge of the varieties is essential.

4. *Seedlings.*—Many individuals are growing Japanese irises from seed and some of the resulting plants possess qualities of unusual merit. In fact, one can obtain from a collection of seed a very wide range in variation in the individual plants from the standpoint of color, size of flower, and other characteristics. It is highly desirable that all plants raised from seedlings which are really superior should be compared with accepted standard varieties. It may or may not be desirable to ultimately name these. In any case, it would be of great value to be able to state that a particular seedling is of very similar type to that of a known

variety. It may develop that the best way to get a good collection of Japanese irises is to grow them from seed, rather than to attempt to secure plants.

5. *Culture.*—A number of difficulties have been encountered in the growing of Japanese irises. The general report is that it is extremely hard to keep and propagate a collection of varieties. Dealers are all the time announcing a shortage of their material. For one reason or another, different varieties are lost from the general collection. The explanation of these facts needs to be experimentally determined.

Plans are being made to find out some things about the cultural requirements of these varieties. Such questions as the following are being considered:

(*a*) *Transplanting.*—The time of year in which this can best be done; how frequently the plants should be divided and transplanted.

(*b*) *Soil Conditions.*—The adaptation of varieties to different types of soil; methods of preparing the soil; the value of flooding during the flowering period.

(*c*) *Fertilizing.*—A determination of the best methods of fertilizing in order to stimulate the growth and development of the plants and the production of abundant bloom.

(*d*) *Disease and Control.*—These varieties, like other plants, appear to have their own particular maladies. An effort will be made to determine the nature of these and the possibilities of successful control.

The main emphasis for the present will be placed upon the study of the varieties of Japanese irises. The plans, however, for the trial garden include similar studies of the other groups of Apogons, particularly the Sibirian and Spurian group. The Garden already has several varieties belonging to these groups and it is proposed to increase the collection of both and carry out studies somewhat along the same general lines as for the Japanese irises.

George M. Reed

ELEVENTH ANNUAL SPRING INSPECTION

Favoring skies, after days of threatening weather, and a record attendance marked the Eleventh Annual Spring Inspection of the Brooklyn Botanic Garden by Trustees, Woman's Auxiliary, members, and invited guests, on May 12.

This year Dame Nature of her own accord provided new features for the entertainment. In past years, the second week in May—the regular week for the Annual Spring Inspection—has been the time of Daffodils and Flowering Crabapples. But this year, by forcing the season, Nature arranged a new set of flowers for the occasion. The Flowering Crabs and Daffodils were past and gone, but the 7,000 red and yellow tulips in the lawn near the conservatories were a dazzling and unforgetable sight, while the exquisitely colored azaleas and irises in various parts of the Garden brought forth enthusiastic praises.

Promptly at 3:30 p.m., the visitors started on the tour of inspection of the grounds, with members of the Botanic Garden Staff acting as guides, and preceded by young standard bearers chosen from the Boys and Girls of the Brooklyn Botanic Garden, who carried the flags of the Botanic Garden, of the City, and of the United States.

At the first objective, the Japanese Garden, the party found the local color enhanced by a genuine Jinrikisha, and nearby, three Japanese in native costume. At the Inari shrine the mysterious temple trappings and accessories were visible for the occasion, including the quaint Japanese bells, and the mirror which is said to reflect the soul of the devout worshipper. Plenty of boiled rice was also placed for the refreshment of the god.

Passing down between the specimen beds of gayly colored tulips, including several wild species and many horticultural varieties, the route led to the Rock Garden. Here Mr. Free, Horticulturist of the Garden, pointed out various Alpine and saxitile species of interest. After inspecting the new plots devoted to the Compositae (Asters, Chrysanthemums, and their relatives), and the Girl Scouts' Tree, planted on Arbor Day by the Girl Scouts of Flatbush, the Children's Building was visited and its

handsome new furniture, presented by Mrs. James H. Post, was admired, as well as a beautiful picture, the gift of Mrs. Edward C. Blum. The experimental garden aroused much interest. North of the experimental garden, on the slope in front of the conservatories, were the tulips, naturalized in the lawn. Four thousand of these were a gift from the nursery where the bulbs were grown—the Seabrook Company's nursery, of which Mr. Alexander M. White, a member of the Botanic Garden Governing Committee, is president.

Tea was served in the main rotunda of the Laboratory Building by the Woman's Auxiliary of the Garden, Mrs. James Mandly Hills being Chairman of the Entertainment Committee. Mrs. Frank Bailey, Mrs. Frank J. W. Diller, Mrs. Lewis W. Francis, and Mrs. Walter Denny Sargent, and Miss Hilda Loines, Chairman of the Auxiliary, were hostesses. The following poured: Mrs. Edward C. Blum, Mrs. Paul Bonynge, Mrs. Walter Shaw Brewster, Miss Alice Brinsmade, Mrs. George Stuart Brown, Mrs. Glentworth Reeve Butler, Mrs. William Hamlin Childs, Mrs. Ira B. Downs, Mrs. Theodore L. Frothingham, Mrs. William H. Good, Mrs. John Hills, Mrs. Charles D. Lay, Mrs. Frank C. B. Page, Mrs. W. Sterling Peters, Miss Jessie W. Post, Mrs. Eugene Swan. Members of the Junior League and of the Botanic Garden Organization assisted in serving.

To accommodate the large number of guests (over 800 being present), several rooms of the Laboratory Building were thrown open. In the Exhibit Room in the north corridor, a series of exquisite water colors of native wild flowers by Mrs. C. D. Walcott, of Washington, D. C., and specimens of their reproduction by the four-color process, had been installed.

TREE PLANTING BY GIRL SCOUTS

On Friday afternoon, April 24—Arbor Day—the Girl Scouts of Flatbush presented to the Botanic Garden and planted an American Elm. The tree was planted in the center of the grass triangle just north of the lower Flatbush Avenue gate, near Empire Boulevard; in planting, the silver trowel, employed at all

previous tree plantings at the Garden, was used. The weather was favorable and about 100 scouts and friends were present. The following was the

PROGRAM

1. Band Selection. Field Music of Girl Scout Troop 55. Conductor Capt. Josephine Mulholland.
2. Community Singing. Programs supplied through the courtesy of The American Tree Association.
3. Recitation of 14 Couplets by 14 Girl Scouts.
4. Address of Presentation. MRS. EVELYN WIGHT ALLAN, Commissioner of Girl Scouts in Brooklyn.
5. Address of Acceptance. DR. C. STUART GAGER, Director of Brooklyn Botanic Garden.
6. Ceremony of Planting, by a Golden Eaglet, SCOUT HELEN BAGENSTOSE.
7. Address of Dedication. REV. J. FREDERIC BERG, Pastor of Reformed Protestant Dutch Church of Flatbush.
8. Community Singing.
9. Band Selections. Trumpeters Lieutenants Dorothy Wilson, Dorothy Parr, Catherine Callan.

NOTES

Botanic Garden Fence.—For some six or eight years there has been need of a new wrought iron fence to surround the Botanic Garden property, and numerous requests have been made from time to time for an appropriation for this purpose. The last request, transmitted through the office of the Park Commissioner, Borough of Brooklyn, was under date of June 18, 1924, for $40,000 of corporate stock, serial bonds, or other funds. Final consideration of the matter was on March 20, 1925, when the Board of Estimate and Apportionment passed a resolution appropriating $40,000 of corporate stock of the City of New York for furnishing and erecting the fence.

Increase in Attendance.—The attendance at the Garden has increased greatly over a year ago. The total monthly attendance

for the first five months for 1924 and 1925 was as follows, in even thousands:

	1924	*1925*
January	17,000	12,000
February	14,000	20,000
March	26,000	41,000
April	39,000	66,000
May	73,000	73,371
June	56,000	

Sunday attendance has also greatly increased. High points were, March 22, 6,437; April 12 (Easter), 7,531; April 26, 7,299; May 3, 9,350; May 17, 9,600.

Staff Conferences.—The last of the monthly conferences and teas of the Garden Staff, which have continued since October, 1924, was held on April 13.

Botanic Garden Trips a High School Requirement.—"In Stuyvesant High School the pupils in Biology 1 (mainly plant study) are all required to take a trip to the Brooklyn Botanic Garden. . . . Such a trip lacks the natural appeal of an outdoor hike, but combines the interest of a wide range of material with the convenience of easy transit. Since one teacher takes care of all the boys, with Saturday and Sunday trips when necessary, for the convenience of the boys who may work, and since the number of boys taking the work has in some terms made seven separate trips necessary, it is obvious that so many outdoor hikes are out of the question as a required part of the work. These Botanic Garden trips are required, and their importance enforced by (1) demerits for failure to attend, (2) additional demerits for failure to hand in a carefully and fully written report, and (3) by a question in mid-term or final examinations based on the trip. Attendance is usually over ninety-five per cent. Encouragement is given for trips made by the pupils on their own initiative by extra credits in the regular course marks." (*Quoted from Bulletin of High Points of the New York City Board of Education.*)

Post Card Bulletins.—Beginning in March, 1925, a series of Post Card Bulletins to members was inaugurated. These call attention to flowering and other features that may be seen to best

advantage during the week following the receipt of the notice. The first Bulletin read: "In bloom; nearly 45,000 Crocuses, 6,000 Winter Aconite, 3,000 Snowdrops." The second Bulletin issued read: "Now in bloom: 18,000 Yellow Daffodils." About one week later: "15,000 Poet's Narcissus, 8,000 Tulips. Japanese cherries." The third, issued May 22, "Wisteria in the Japanese Garden, Bearded Iris in Japanese Garden and along Brook. Rock Garden. Next week, Rhododendrons near the lake." It is planned to issue three or four bulletins each spring and fall. Each carries a standing notice concerning Docentry Service.

Distribution of Plants.—In the spring of 1924 the Garden found itself, for the first time, in position to distribute surplus living plant material to members. In March of that year a post card notice was sent notifying members that roots of 20 varieties of Michaelmas Daisies (horticultural varieties of wild Asters) were available in limited quantity. About 1,000 plants were distributed on March 27 and 28 to about 79 members.

The second distribution of Asters occurred on April 1, 2, and 3 of the current year, 765 roots being supplied to 74 members. The demand exceeded the supply and roots of *Boltonia* and *Phlox* were substituted. The third distribution was of Canna roots on May 7 and 8, when 728 bulbs of our choice varieties were distributed to 72 members.

Botanic Garden Wreath for Bust of Asa Gray.—On the afternoon of May 21 a bust of the noted American botanist, Asa Gray, by the sculptor, Chester Beach, was unveiled at the Hall of Fame at New York University, University Heights, Bronx. The bust was donated by The Gray Herbarium, of Harvard University, and friends and relatives of Gray. The presentation was made by Miss Katharine P. Loring, a niece of Mrs. Asa Gray, and the unveiling was by Miss Alice A. Gray, a niece of Professor Gray. The speakers were Dr. Charles W. Eliot, President-emeritus of Harvard University, whose tribute was delivered by the phonofilm, and Prof. Benjamin L. Robinson, curator of the Gray Herbarium since 1892 and, since 1900, Asa Gray professor of systematic botany in Harvard. By invitation of the Director of the Hall of Fame, Dr. Robert Underwood Johnson, the Brooklyn

Botanic Garden and the New York Botanical Garden laid wreaths at the base of the bust. The wreath from the Brooklyn Garden was of Southern Laurel leaves, tied with ribbons of white and green, the Brooklyn Botanic Garden colors.

Penny Packets of Seeds to School Children.—The annual distribution of Penny Packets of Seeds to School Children practically closed the last of April. Seeds were supplied in considerable quantity to schools in Manhattan and Queens as well as in Brooklyn. The price (which was raised to 2 cents after the war) was this year restored to one cent. The number of packets distributed this year reached the high water mark of 530,359 as against 204,000 packets a year ago—an increase of nearly 160 per cent.

Broadcasting.—On March 31 the director of the Garden, by invitation, broadcasted a talk from Station WJY on "The Brooklyn Botanic Garden." During April and May Miss Shaw gave three talks over the Municipal Station WNYC as follows: April 20: Get acquainted with your garden. April 23: Garden steps. May 4: How to take care of your garden. May 18: Planting a small flower garden. May 25: Summer care of the garden.

Exhibits and Teas for Teachers.—For the purpose of acquainting the teachers of the public and private schools with our illustrative material and other equipment which we use in giving instruction to visiting classes, the Department of Elementary Instruction, under Miss Shaw's direction, gave a series of three exhibits of this material during the spring. Special invitations were sent to the teachers. Each exhibit was kept open for teachers and pupils for several days. The following are the dates, subjects, and attendance on the opening day:

March 24. Economic Plants. 150.
April 29. Plant Friends and Enemies. 200.
May 21. Flowers, Trees, Weeds, and the Spring aspect of the Outdoor World. 100.

Cooperation with National Federation for Child Study.—On March 4 Miss Shaw gave a talk on *Children's Gardening and Nature Study* before the National Federation for Child Study.

As a result the Federation asked the Botanic Garden to give a course on that subject at the Garden. Fourteen registered for a course of 5 lectures.

Visitors to the Garden during the first six months of the year have included Dr. and Mrs. Ephraim Hareubeni, of Jerusalem. Dr. Hareubeni has made a thorough study of the flora of Palestine and has had on exhibit in New York a large collection of herbarium specimens of Palestinian plants. It is his plan to establish a botanic garden in Jerusalem with branch gardens in other cities.

Also (on April 3) Prof. Dr. Hans Molisch, professor of plant physiology at the University of Vienna, and for the past two years exchange professor at the Imperial University at Sendai, Japan; Prof. Edith A. Roberts, Vassar College (Feb. 14); Charles S. Lewis, Secy., American Fern Society (Feb. 14).

Biology in High Schools.—The editor was recently asked by a college president why biology was not " holding its own " in high schools and colleges today. The reply was that the question involved an incorrect assumption, since biology and biological subjects such as botany, zoology, and human physiology and hygiene are not only holding their own but are now increasing, both as to number of schools where taught, and number of students taking such subjects either as elective or as required studies. The following item in a recent issue of *School Life* is in harmony with the latter view.

" Biology, according to a study of science in California reported in the *University High School Journal,* has made rapid development in that State within the past few years. In 1907–8 biology appeared in only two high schools. In 1922–23 it was given in 59.5 per cent of the schools and is still on the increase. General science, more evenly distributed than any other science except physics and chemistry, appears in 96.4 per cent of schools with an enrollment of 1,000 or over."

Paper from Rubber Latex.—A series of leaflets published by the Conservator of Forests, Federated Malay States and Straits Settlements, in connection with exhibits at the British Empire Exhibition at Wembley, are printed on paper made from the milky

juice or latex of the rubber tree. This appears to be a quite new paper-making material and gives a paper without fiber with a very satisfactory surface finish. It would be interesting to know something of the durability of this paper, since one of the most important problems in connection with the publication of scientific periodicals is to secure a paper with a surface capable of taking half-tone illustrations satisfactorily, and which at the same time will have a durability expressible in terms of centuries. Investigators are now consulting in our technical libraries printed books three and four hundred years old. If the paper on which these books are printed had been manufactured according to most of our modern paper, the books would not have remained usable over these centuries. It is discouraging to think that so much of our modern scientific publication is on sulphite wood pulp paper. Many publications printed on this stock are beginning already, after a lapse of not more than twenty-five years, to show signs of disintegration. The Botanic Garden library is indebted to the Conservator of Forests for three of the pamphlets above mentioned—one on Gutta Percha, one on Rattan, and one on Damar and Copal (two of the most important groups of resins obtained in the Federated Malay States).

The Brooklyn Institute of Arts and Sciences

OFFICERS OF THE BOARD
OF TRUSTEES

PRESIDENT
FRANK L. BABBOTT

FIRST VICE-PRESIDENT
WALTER L. CRITTENDEN

SECOND VICE-PRESIDENT
EDWARD C. BLUM

THIRD VICE-PRESIDENT
WILLIAM A. PUTNAM

TREASURER
G. FOSTER SMITH

SECRETARY
JOHN H. DENBIGH

BOTANIC GARDEN GOVERNING COMMITTEE

FRANK BAILEY, *Chairman*

FRANK L. BABBOTT, *Ex officio*
MRS. WILLIAM H. CARY
WALTER H. CRITTENDEN
GATES D. FAHNESTOCK
MRS. LEWIS W. FRANCIS
JOHN W. FROTHINGHAM
MISS HILDA LOINES
EDWIN P. MAYNARD
WILLIAM A. PUTNAM
ALEXANDER M. WHITE

EX OFFICIO MEMBERS OF THE BOARD

THE MAYOR OF THE CITY OF NEW YORK
THE PRESIDENT OF THE BOROUGH OF BROOKLYN
THE COMMISSIONER OF PARKS, BOROUGH OF BROOKLYN

GENERAL INFORMATION

MEMBERSHIP.—All persons who are interested in the objects and maintenance of the Brooklyn Botanic Garden are eligible to membership. Members enjoy special privileges. Annual Membership, $10 yearly; Sustaining Membership, $25 yearly; Life Membership, $500. Full information concerning membership may be had by addressing *The Director, Brooklyn Botanic Garden, Brooklyn, N. Y.* Telephone, 6173 Prospect.

THE BOTANIC GARDEN is open free to the public daily from 8 a.m. until dark; on Sundays and Holidays open at 10 a.m.

ENTRANCES.—On Flatbush Avenue, near Empire Boulevard (Malbone Street), and near Mt. Prospect Reservoir; on Washington Avenue, south of Eastern Parkway and near Empire Boulevard; on Eastern Parkway, west of the Museum Building.

The street entrance to the Laboratory Building is at 1000 Washington Avenue, opposite Montgomery Street.

TO ASSIST MEMBERS and others in studying the collections the services of a docent may be obtained. This service is free of charge to *members of the Botanic Garden;* to others there is a charge of 50 cents per person. Arrangements must be made by application to the Curator of Public Instruction at least one week in advance. No parties of less than six adults will be conducted.

TO REACH THE GARDEN take Broadway (B.M.T.) Subway to Prospect Park station; Interborough Subway to Eastern Parkway-Brooklyn Museum Station; Flatbush Avenue trolley to Empire Boulevard; Franklin Avenue, Lorimer Street, and Tompkins Avenue trolleys to Washington Avenue; St. John's Place trolley to Sterling Place and Washington Avenue; Union Street and Vanderbilt Avenue trolleys to Prospect Park Plaza and Union Street.

PUBLICATIONS
OF THE
BROOKLYN BOTANIC GARDEN

RECORD. Established, January, 1912. An administrative periodical issued quarterly. Contains, among other things, the *Annual Report* of the director and heads of departments, special reports, announcements of courses of instruction, seed list, miscellaneous papers, and notes concerning Garden progress and events. Free to members of the Garden. To others one dollar a year; 25 cents a copy.

MEMOIRS. Established, July, 1918. Published irregularly.

Volume I, *Dedication Papers:* comprising scientific papers presented at the dedication of the laboratory building and plant houses, April 19–21, 1917. Price $3.50, plus postage.

Volume II. The vegetation of Long Island. Part I, The vegetation of Montauk: A study of grassland and forest. Price $1.00, plus postage.

CONTRIBUTIONS. Established, April 1, 1911. Papers originally published in periodicals, reissued as "separates," without change of paging, and numbered consecutively. This series includes occasional papers, as well as those embodying the results of research done at the Garden, or by members of its staff or students. Twenty-five numbers constitute one volume. Price 25 cents each, $5.00 a volume.

36. Influence of environmental factors on the infection of Sorghums and Oats by smuts. I. Experiments with covered and loose kernel smuts of Sorghum. 17 pages, 7 figures. 1924.

37. Influence of environal factors on the infection of sorghums and oats by smuts. II. *Experiments with covered smut of oats and general considerations.* 21 pages, 3 plates. 1924.

38. Physiologic races of oat smuts. 10 pages, 3 plates. 1924.

40. Physiological specialization of Ustilago hordei. 21 pages, 1 figure. 1924.

41. Factors influencing the infection of wheat by Tilletia Tritici and Tilletia laevis. 24 pages, 4 plates. 1924.

42. Variation among the sporelings of a fertile sport of the Boston fern. 27 pages, 15 figures. 1924.

44. Modes of infection of Sorghums by loose kernel smut. 17 pages, 3 plates. 1925.

LEAFLETS. Established, April 10, 1913. Published weekly or biweekly during April, May, June, September, and October. The purpose of the *Leaflets* is primarily to give announcements concerning flowering and other plant activities to be seen in the Garden near the date of issue, and to give popular, elementary information about plant life for teachers and others. Free to members of the Garden. To others, fifty cents a series. Single numbers 5 cents each.

GUIDES to the collections, buildings, and grounds. Price based upon cost of publication.

SEED LIST. Established, December, 1914. Since 1925 issued each year in the January number of the RECORD.

AMERICAN JOURNAL OF BOTANY. Established, January, 1914. Published, in coöperation with the BOTANICAL SOCIETY OF AMERICA, monthly, except during August and September. Subscription, $6.00 a year.

ECOLOGY. Established, January, 1920. Published quarterly in coöperation with the ECOLOGICAL SOCIETY OF AMERICA. Subscription, $4.00 a year.

GENETICS. Established, January, 1916. Bi-monthly. Subscription, $6.00 a year.

BROOKLYN BOTANIC GARDEN RECORD

VOL. XIV OCTOBER, 1925 No. 4

EDITED BY
C. STUART GAGER

CONTENTS

PAGE

Prospectus of Courses, Lectures, and Other Educational Advantages Offered to Members and to the General Public 127
Notes 144
Index to Volume XIV 146

PUBLISHED QUARTERLY
AT LANCASTER, PA.
BY THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES

Entered as second-class matter in the Post-office at Lancaster, Pa., under Act of August 24, 1912.

BROOKLYN BOTANIC GARDEN

Scientific, Educational, and Administrative Officers

SCIENTIFIC AND EDUCATIONAL

The Staff *

C. STUART GAGER, Ph.D., Sc.D., Pd.D., *Director*
MONTAGUE FREE, *Horticulturist*
ARTHUR HARMOUNT GRAVES, Ph.D., *Curator of Public Instruction*
ALFRED GUNDERSEN, Docteur de l'Université (Paris), *Curator of Plants*
ELSIE TWEMLOW HAMMOND, M.A., *Assistant Curator of Elementary Instruction*
GEORGE M. REED, Ph.D., *Curator of Plant Pathology*
ELLEN EDDY SHAW, B.S., *Curator of Elementary Instruction*
RAY SIMPSON, *Librarian*
NORMAN TAYLOR, *Curator of Plants and Plantations*
ORLAND E. WHITE, Sc.D., *Curator of Plant Breeding and Economic Plants*

Other Officers

MARY AVERILL, *Honorary Curator of Japanese Gardening and Floral Art*
HAROLD A. CAPARN, *Consulting Landscape Architect*

RALPH CURTISS BENEDICT, Ph.D., *Resident Investigator*

MAUDE L. HICKOK, *Instructor*
LAURA ALMA KOLK, M.A., *Research Assistant*
MARY ELLEN PECK, A.B., *Research Assistant*
ETHEL V. WOODWARD, *Instructor*

EDITH R. DALY, *Library Assistant*
MARGARET R. ELLIS, *Curatorial Assistant*
HELEN SMITH HILL, *Curatorial Assistant*
LOIS DAVIS VAN GORDEN, *Curatorial Assistant*
CHARLOTTE S. YOUNG, A.B., *Curatorial Assistant*

ADMINISTRATIVE

DANIEL C. DOWNS, *Secretary and Accountant*
MAUDE E. VORIS, *Assistant Secretary*
MARION S. GIBBS, *Business Office Assistant*

ANN C. OHLANDER, *Secretary to the Director*
FRANK STOLL, *Registrar and Custodian*
WILLIAM H. DURKIN, *Membership Secretary*

LAURA M. BREWSTER, *Stenographer*
ALVHILD LINNEA WIMAN, *Stenographer*

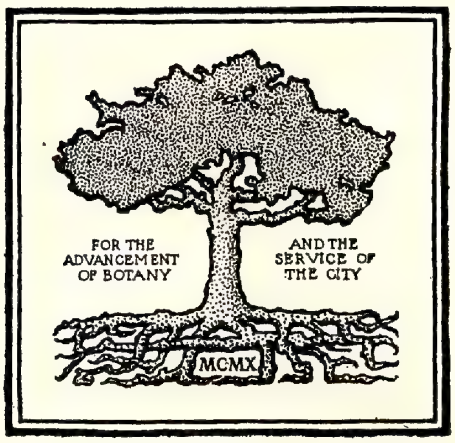
LOUIS BUHLE, *Photographer*

* The names are arranged alphabetically.

BROOKLYN BOTANIC GARDEN RECORD

EDITED BY

C. STUART GAGER



VOLUME XIV

1925

PUBLISHED QUARTERLY
AT LANCASTER, PA.
BY THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES

LANCASTER PRESS, INC.
LANCASTER, PA.

TABLE OF CONTENTS OF VOLUME XIV

No. 1, January

PAGE

List of Seeds Collected During the Year 1924 and Offered in Exchange 1

No. 2, April

Fourteenth Annual Report of the Brooklyn Botanic Garden, 1924..... 21
- Report of the Director..... 21
- Report of the Curator of Plants and Plantations..... 46
- Report of the Curator of Plants..... 48
- Report of the Curator of Plant Breeding and Economic Plants.... 53
- Report of the Horticulturist and Head Gardener..... 54
- Report of the Curator of Plant Pathology..... 58
- Report of the Curator of Public Instruction..... 60
- Report of the Curator of Elementary Instruction..... 64
- Report of the Librarian..... 71
- Financial Statements for 1924..... 76
  - 1. Tax Budget Accounts..... 76
  - 2. Private Funds Accounts 78
- Appendices 1–7..... 83

No. 3, July

The Test Garden for Beardless Irises..... 115
Eleventh Annual Spring Inspection..... 119
Tree Planting by Girl Scouts..... 120
Notes 121

No. 4, October

Prospectus of Courses, Lectures, and Other Educational Advantages Offered to Members and to the General Public..... 127
Notes 144
Index to Volume XIV..... 146

ILLUSTRATIONS

		Page
1.	Bearded Iris. West of the brook, facing south	opp. 21
2.	*Victoria cruziana* in flower. Conservatory Pool	25
3.	Japanese Garden in winter	31
4.	Juniper Point, north shore of the lake	39
5.	Pelican flower (*Aristolochia grandiflora*) in the conservatory	47
6.	Public School pupils on arrival to see the motion picture reels on Tea, presented by Sir Thomas Lipton	52
7.	Class from Public School studying trees in their winter condition. The instructor is using the megaphone	55
8.	Pupils in children's garden class drinking at the bubbler fountain on the south wall of the Children's Building	59
9.	Scene in the Children's Garden, June 1	65
10.	Lesson in bulb planting at Public School 36	70
11.	1. Double form of Japanese Iris; 2. Roof Iris of Japan (*Iris tectorum*) in Rock Garden of Brooklyn Botanic Garden	opp. 115

BROOKLYN BOTANIC GARDEN RECORD

VOL. XIV OCTOBER, 1925 NO. 4

I. COOPERATION WITH LOCAL SCHOOLS

The Brooklyn Botanic Garden aims to cooperate in every practicable way with the public and private schools of Greater New York in all matters relating to the study of plants. The purpose of the Garden in this connection is to supplement and enrich the school work in the way of instruction, demonstration, study material, etc., which otherwise would not be available.

Geography classes, as well as classes in nature study and botany, are finding the collection of useful plants in the economic plant house, and also our Japanese Garden, valuable adjuncts to their class work. Arrangements may be made by teachers of geography to have their classes study these collections under the guidance of a docent. Illustrated lectures for geography classes may also be arranged for at the Garden.

The systematic collection in the main part of the Garden, where the living plants are arranged by orders and families, is proving of great value for demonstration to visiting high school classes in botany.

A. Talks at Schools.—The principals of public or private schools may arrange to have lantern talks given at the schools on various topics related to nature study, such as garden work with children, tree planting, and Arbor Day. If an illustrated lecture is desired, the lantern and operator must be provided by the school, but slides will be furnished by the Botanic Garden. Address the *Curator of Elementary Instruction* for a list of talks and for appointments.

B. School Classes at the Garden.—(*a*) Schools not provided with a stereopticon, and other schools, may arrange for classes, accompanied by their teachers, to come to the Botanic Garden for

lectures either by the teacher or by a member of the Garden Staff.

(*b*) Notice of such a visit should be sent at least *one week* previous to the date on which a talk is desired. These talks will be illustrated by lantern slides, and by the conservatory collection of useful plants from the tropics and subtropics. Spring and fall announcements of topics will be issued during 1925–6.

(*c*) The Garden equipment, including greenhouses, plant material, lecture rooms, lantern and slides, is at the disposal of teachers who desire to instruct their own classes at the Garden. Arrangements must be made in advance so that such work will not conflict with other classes and lectures. For High School classes address *Curator of Public Instruction.* For Junior High and Elementary School classes address *Curator of Elementary Instruction.*

(*d*) The principal of any elementary or high school in Brooklyn may arrange also for a series of six lessons on plant culture to be given during the fall or spring to a class. These lessons will be worked out for the most part in the greenhouse. Such a course must be arranged for in advance, and the class must be accompanied by its teacher. Adapted for pupils above the third grade.

C. School and Home Gardening.—In order to encourage gardening in the school and at home, an annual Children's Garden Exhibit is held at the Garden in September. Prizes for excellence in various subjects are awarded to both schools and individuals. The privilege of competition in this exhibition is open to any school and also to any boy or girl in Brooklyn, even though the garden products exhibited may have been raised at his summer home. A *Leaflet* describing in detail the conditions for the exhibit and the prizes offered will be mailed on request.

The exhibit for 1925 will be held on *Saturday* and *Sunday, September 26* and *27.* All exhibits, of schools as well as of individuals, must be brought to the Brooklyn Botanic Garden before 12 o'clock, *Friday, September 25.* The exhibits will be judged at 1 o'clock on that afternoon, and will be open for public schools at 2 p.m., Friday, when classes are invited to come with their teachers. The exhibit will be open to the general public on Saturday and Sunday from 10 to 4. After 4 o'clock on Sunday afternoon the exhibitors may remove their exhibits. Prizes will be presented on Saturday afternoon, *October 24,* at 2:30 o'clock.

D. Seeds for School and Home Planting.—In order to assist the above work, penny packets of seeds are put up by the Botanic Garden for children's use. In the early spring, lists of these seeds, conditions for entry as an exhibitor, and other information may be secured on application to the *Curator of Elementary Instruction.*

E. Conferences.—Conferences may be arranged by teachers and principals for the discussion of problems in connection with gardening and nature study. The last Monday afternoon of each month will be reserved for such conferences: appointments must be made in advance. Address Miss Ellen Eddy Shaw.

F. Study and Loan Material.—To the extent of its facilities, the Garden will provide, on request, various algae and protozoa, as well as living plants, leaves and twigs, or other plant parts for study. Where containers are necessary, as in the case of the algae and protozoa, they must be furnished by the school. Petri dishes will, on request, be filled with sterilized nutrient agar ready for use in the study of bacteria and molds. They should be delivered to the Garden, clean, and in general one week before the agar is desired. In all cases arrangements must be made by the teachers for calling for such material.

MATERIAL USUALLY AVAILABLE

1. Protozoa: Paramoecium, Vorticella, and others.
2. Pleurococcus.
3. Spirogyra.
4. Vaucheria.
5. Blue-Green Algae.
6. Moss plants: Gametophyte and sporophyte, with capsules.
7. Fern Prothallia. For these, a Petri dish with a cover is the best container to bring, since the prothallia dry out quickly.
8. Fern Sporophylls (with sori).
9. Coleus and Tradescantia—Variegated green and white, loaned for photosynthesis experiment.
10. Cacti, Pitcher plant, Sundew (*Drosera*), and Venus's Flytrap (*Dionaea*)—Loaned for demonstration.
11. Elodea—To show movement of protoplasm.

12. Various collections loaned for exhibit: *e.g.,* lichens, fungi, plant diseases, fruits, demonstrations of Mendel's law.

Teachers may also arrange to have various physiological experiments or demonstrations conducted at the Garden for the benefit of their classes. Communications in regard to these matters should be addressed to the *Curator of Public Instruction.*

G. Loan Sets of Lantern Slides.—Sets of lantern slides have been prepared for loan to the schools. Each set is accompanied by a short syllabus of explanatory nature. In all cases these sets must be called for by a special messenger and returned promptly in good condition. The subjects now available are as follows. Other sets are in preparation.

1. Plant Life
2. Spring Wild Flowers
3. Common Trees
4. Fall Wild Flowers
5. Forestry (2 sets)

II. DOCENTRY

To assist members and others in studying the collections the services of a docent may be obtained. Arrangements must be made by application to the Curator of Public Instruction at least one week in advance. No parties of less than six adults will be conducted. This service is free of charge to members; to others there is a charge of 50 cents per person. For information concerning membership in the Botanic Garden see page 3 of the cover of this Prospectus.

III. COURSES OF INSTRUCTION

A. Children's Gardens: Nature Study

For the work in Children's Gardening and Nature Study the following equipment is available:

1. *The Children's Gardens,* on a piece of land about three-quarters of an acre in extent, in the south-east part of the Botanic Garden, divided into about 150 plots which are used throughout the season for practical individual instruction in gardening.

2. *The Children's Building,* at the north end of this plot, containing rooms for consultation and for the storage of tools, seeds, notebooks, special collections, etc.

3. *The Instructional Greenhouses,* three in number, for the use of juvenile as well as adult classes for instruction in plant propagation and related subjects.

4. Two *Classrooms* (in addition to the Boys' and Girls' Club Room in the Laboratory Building), equipped with stereoscopes and views, a stereopticon, plant collections, economic exhibits, models, and other apparatus and materials for instruction.

5. Two *Laboratory Rooms,* with the usual equipment for plant study.

6. The *Auditorium,* on the ground floor, capable of seating 570 persons, and equipped with a motion-picture lantern and stereopticon.

In addition to these accommodations, the dried plant specimens in the herbarium and the living plants in the conservatories and plantations are readily accessible, while the main library and children's library, which contain a comprehensive collection of books on every phase of gardening and plant life, may be consulted freely at any time.

1. *Courses for Children*

The following courses are open to all boys and girls. Enrollment in these courses entitles the boy or girl to membership in the Boys' and Girls' Club of the Brooklyn Botanic Garden. This club, having an active membership of about 1,000, meets four times a year for discussion of subjects related to plant life. Papers, by members, on various botanical and horticultural subjects are read at these meetings, and the speakers are then entitled to a silver pin, providing they have satisfactorily completed courses of study at the Garden extending over at least six months. For announcement concerning Children's Room see page 17.

A1. Fall Greenhouse Work.—The following courses are self-explanatory and are for both beginners and advanced students:

Class A.—Open to boys and girls who have never taken any greenhouse work before. Bulbs used: narcissus, oxalis, primrose; also geranium cuttings. *Saturday* mornings at 9:15. *Fee, fifteen cents. October 17 to December 12.* Miss Hickok.

Class B.—Open to boys and girls over thirteen years of age. Subjects studied: hyacinth, Easter lily, calla lily, the botany of common cultivated plants, etc. *Fee, twenty-five cents. Saturday* mornings at 10, *October 17 to December 12.* Miss Woodward.

Class C.—Open to boys and girls who have been in at least two fall bulb classes before this. This class is for advanced work. The bulbs used will be hyacinth, tulip, narcissus, oxalis. Geranium cuttings and primroses will also be used. Time of class, 10:30, *Saturday* mornings. *Fee, fifteen cents. October 17 to December 12.* Miss Hammond.

Class D.—Open to any boy or girl. Subject: the making of garden Christmas presents. There will be a choice of gifts. Some of the articles made will be the following: a flower basket, seed packet, flower book-mark, painted pot and plant to go in it, flower calendar, wooden box with flower design, etc. *Saturday* mornings at 10:30. *Fee, twenty-five cents. October 17 to December 12.* Miss Woodward.

Class E.—Silver Pin work as applied to greenhouse and garden work. The members of this class will be selected from students eligible for this work. *Fee, twenty-five cents.* Miss Hammond.

A2. Junior Gardeners' Course.—This is a course for boys 14–17 years of age. Lessons are given in the care of border and other flower beds, in the weeding and care of small vegetable gardens, in mowing and watering lawns, repotting plants, etc. This is planned to fit boys for summer work and to enable them to obtain positions. Hours to be arranged. *Fee, fifty cents.* Miss Hickok.

A3. Preparation for the Outdoor Garden.—The following classes are open to boys and girls during the spring of each year. The courses are planned for a better understanding of plant life and so that the outdoor garden may become a more intelligent piece of work. On account of limited space in the Children's Greenhouse, classes are limited to twenty. The fee for each course is *fifteen cents* to cover the cost of material.

Boys' Spring Course.—(a) *Saturday* mornings, 9–10:15, *February 6 to April 3.* (b) *Saturday* mornings, 10:30–11:30, *February 6 to April 3.*

Girls' Spring Course.—(a) *Saturday* mornings, 9–10:15, *February 6 to April 3.* (b) *Saturday* mornings, 10:30–11:30, *February 6 to April 3.* Miss Woodward, Miss Hickok.

A4. Advanced Work for Older Boys and Girls.—How to raise plants, mix soils, transplant, start seedlings for outdoor gardens, etc. Boys and girls who have taken spring courses under A4 are eligible for advanced work. The fee for the course is *twenty-five cents.* Each student may take home his plants and seedlings. This course is open to both boys and girls over twelve years of age. *Saturday* mornings at 9:30, *January 9 to March 27.*

Miss Hammond.

A5. The Beginners' Garden.—Open annually to 50 boys and girls who have never had instruction in gardening at the Brooklyn Botanic Garden. This course takes up the subject of the small garden, what to plant, how to plant it, care, replanting, etc. *Application for plots should be made in person or in writing before March 1.* Size of plots 8 ft. by 10 ft. All crops belong to the individual. *Fee, twenty-five cents. Saturday* mornings, 9–12, *April 17 to October 2.* Miss Woodward.

A6. Second Year Gardens.—Open to 50 boys and girls who have had one or more seasons at the Brooklyn Botanic Garden—a continuation of Course A3. Registration should be made before September 1 of each year for the following year. *Fee, twenty-five cents. Saturday* mornings, 9–12, *April 17 to October 2.*

Miss Hickok.

A7. Junior Garden Assistants.—Open to older boys and girls, or to those who have mastered Courses A2 and A4. Size of plot 10 ft. by 20 ft. These gardens are for the raising of vegetables. The work is in the nature of a project, "How much can one raise on a plot 10 ft. by 20 ft.?" Hours to be arranged. The student must put in at least two periods a week during the summer vacation, and, if possible, three. Registration date: *April 2. Fee, fifty cents.* Miss Hickok.

A8. Advanced Nature Work.—A course designed for those older boys and girls who have taken Courses A1–A5. Herbarium specimens will be prepared and the simpler principles of plant classification studied. Projects will be assigned to individuals.

Open only to pupil assistants of the Garden. Hours to be arranged. *No fee.* Miss Hammond.

A9. Nature Study for Boy Scouts, Girl Scouts, Camp Fire Girls, Scout Leaders, and Others.—Short courses of at least four periods each, with talks, demonstrations, and field trips in the grounds of the Botanic Garden and Prospect Park to study trees, shrubs, etc. The instruction and schedule dates will be adapted to meet the needs of the various groups that apply. *Open only to groups of at least ten persons.* Hours to be arranged. *No fee.* Dr. Graves, Miss Hammond, and assistants.

A10. Special Work for High School Pupils.—A course in gardening or greenhouse work adapted for high school pupils. Classes to be arranged for by the high school teacher. *No fee.* Miss Shaw, Miss Hammond.

A11. Preparatory Course for Scout Test.—Identification of wild flowers and trees. *Saturdays, 11 a.m. No fee. October 3 to June 12.* Miss Hammond.

2. Courses for Teachers

The following brief courses are designed primarily for teachers who wish to extend their knowledge of nature study and gardening for use in their school work, without taking the longer courses described under B, page 9. It should be noted that only the latter courses are accepted by the Board of Education for teachers' credits.

A21. Greenhouse Work for Teachers.—Not given in 1926.

A22. The School Garden.—Not given in 1926.

A23. Spring Nature Study for the Classroom.—This course of three lessons will acquaint the teacher with common nature study material which may be taken into the classroom during the springtime. Demonstration materials will be given to members of this class. The work will be based on the syllabus of nature study for the schools of New York City, and will be entirely practical. *No fee. Mondays, 4 p.m., May 3–17.* Miss Hammond.

A24. Fall Garden Work.—Three lessons on home plants; window boxes; indoor planting of bulbs; the outdoor bulb bed. *Fee, one dollar. Mondays, 4 p.m., October 5–19.* Miss Shaw.

A25. Fall Nature Study.—This course is a complement to the spring nature study work and the material used will be the common material one would use in classroom work, showing seed dispersal, evergreens, deciduous trees, etc. Such subjects as Nature's preparation for winter will be considered. Three lessons. *No fee. Thursdays, 4 p.m., October 1–15.* Miss Hammond.

A26. Greenhouse Work.—A course planned for those who have taken "B3, Principles of Agriculture and Horticulture." Fifteen weeks of practical work in the greenhouse. *Limited to 20 members. Fee, eight dollars. Tuesdays, 4 p.m., beginning October 13.* Miss Shaw.

B. Courses for Teachers of Children's Gardening and Nature Study

The courses for teachers in children's gardening are planned not only to prepare for garden work, but for the teaching of nature study as well. The courses are so arranged that they emphasize not only the theory of each subject, but its actual practice, either in classroom, greenhouse, garden, or field. At the same time the work is correlated to meet the needs of each grade of the elementary school. There is an increasing demand for good nature study work in our schools, and we make a special point of giving simple, definite, helpful work, grading it so that it applies directly to the immediate needs of our own city schools. Practice with classes of children of different ages is given in all this work.

The requirements for entrance are a certificate from a city training or a normal school, a college diploma, or several years of certified successful teaching. These courses may be completed during one year, or may be extended over a period of two or more years. The *fee for the entire course is thirty-five dollars,* payable in full at the time of registration, or course by course in advance. No money will be refunded if the student drops the work, and no monetary allowances will be made for courses taken at other institutions, although time allowances will be made.

Special stress is put upon the outdoor garden practice. This practice is of two kinds: (1) Practice with children. There are one hundred and fifty children in our outdoor garden, and every

opportunity is given for practice in working with children and for the solving of problems connected with this phase of the work. (2) Practice in the teacher's garden. Each member of the class has a garden of her own and works it herself, thus performing all gardening operations to be taught later to children.

To those who satisfactorily complete this course a certificate will be given. *The five courses offered in children's gardening constitute one unit.* Open only to teachers.

These courses have been accepted by the Board of Education of the City of New York for teachers' credits as follows:

1. Any of the courses will be accepted toward meeting clause "b" of the conditions of eligibility for a high-school license in biology.

2. The course in Pedagogy of Botany and Educational Principles of Children's Gardening (B4) will be accepted as a satisfactory 15-hour course in Pedagogy toward meeting the requirement of 60 hours' work in Pedagogy in lieu of the written test in Principles and Methods of Teaching for Promotion License.

3. This course will be accepted as a pedagogical course, and any of the other four courses will be accepted as an academic course toward meeting the conditions of exemption from the academic paper in the examination for license as assistant to principal. Such exemption is granted to those who offer 120 hours of satisfactory work, 60 of which must be in the Science of Education and 60 in some branch of literature, science, or art, such 120 hours' work not being accomplished wholly within one academic year.

These courses have also been accepted by the Brooklyn Teachers' Association and appear in its syllabus of courses.

The individual student may apply at any college for credits on these courses, which will be granted according to individual merit.

B1. General Botany.—Thirty sessions. A course designed to make clear the fundamental principles of morphological and physiological botany. Although, with a view to correlation with the other courses described below, particular emphasis is laid upon the higher plants, all of the main groups of plants are considered, by means of informal lectures, discussions, demonstrations, and visits

to the living material in the conservatories and the outdoor plantations. *Fee, $5. Wednesdays,* 4 p.m., beginning *September 30.*

Dr. Graves.

B2. Nature Study.—Thirty sessions. This course covers the plant material used in teaching nature study, and includes the identification of the common trees, shrubs, plants, wild flowers, and weeds. Mounts, charts, and diagrams are made. The student becomes familiar with the actual material. The course is entirely practical, work being done in both field and laboratory. Two hours of class work are credited as one hour. *Fee, $5. Tuesdays,* 4 p.m., beginning *September 29.* Miss Hammond.

B3. Principles of Agriculture and Horticulture.—Thirty sessions. This course will be especially helpful to teachers. The principles of horticulture are considered and applied in a practical way through greenhouse, laboratory, and lecture work. The greenhouse work includes the following subjects: plant propagation by means of bulbs, rhizomes, roots, seeds, etc.; the care of the greenhouse; house plants; window-box materials; fertilizers. Insect and fungous pests, grafting and pruning are also included from both a practical and a theoretical point of view. *Fee, $7. Wednesdays,* 4 p.m., beginning *September 30.*

Miss Shaw and Mr. Free.

B4. Pedagogy of Botany and Educational Principles of Children's Gardening and Nature Study.—Fifteen sessions. Discussion of the mental processes involved in learning and in teaching science, and the fundamental principles which underlie and point the way to laboratory and field work. After this a course of study in gardening and nature study, based on the school syllabus, is worked out and the basic psychological and pedagogical principles discussed. This course includes all the modern phases of the subject and is so arranged that it may be applied directly in classroom work. *Fee, $5. Thursdays,* 4 p.m., *October 1 to January 28.* Dr. Gager and Miss Shaw.

B5. Garden Practice.—Fifteen sessions. This course is entirely practical and includes all the outdoor work of the student in his own garden, applying the principles of agriculture and gardening, work with children in the garden, basketry and woodwork. *Fee,*

$5: for summer practice, fee $8 additional. Thursdays, 4 p.m., *February 4 to May 20.* Miss Shaw.

C. Courses for the General Public

The following courses are open to any one who has a general interest in plants. Teachers are welcome. They are *free to members of the Botanic Garden;** for others a small fee is required, as specified. Registration should be made with the instructor in person or by mail at least one week before the course opens, in order that adequate material, etc., may be provided. *No course will be given when less than six apply.*

1. *Full Year Course.*

C10. The Life of Plants.—Thirty exercises, extending through the school year, consisting of informal lectures, demonstrations, and short trips to the conservatories and outdoor plantations. No previous knowledge of botany is necessary. The main purpose of the course is to enable any who are interested to become acquainted with the different main groups of plants—their life histories, habits, economic uses, etc. Bacteria, algae, fungi, lichens, mosses, ferns, cycads, and flowering plants are considered. The various functions manifested by plant life in general, such as growth, reproduction, sensitiveness, movement, respiration, and metabolism, are also discussed. *Fee, $5. Wednesdays,* 4 p.m., beginning *September 30.* Dr. Graves.

2. *Fall Courses*

C4. Gardening in the Fall.—Six lessons, with practical work in the greenhouse, on the methods of making cuttings, the various kinds of bulbs for fall planting, their treatment and care, the proper management of house plants and a discussion of the kinds suitable for cultivation. *On account of restricted space in the greenhouse, this class must be limited to 40. Registration according to the order of application. Fee, $3.00. Thursdays,* 4 p.m., *September 24 to October 29.* Mr. Free.

* For information concerning membership in the Brooklyn Botanic Garden consult the third page of the cover of this PROSPECTUS.

C5. Trees and Shrubs in their Winter Condition.—Eight outdoor lessons in the Botanic Garden and elsewhere in Greater New York on the characteristics of our common trees and shrubs, both native and cultivated, emphasizing their distinguishing features in the winter condition. *Fee, $4.00. Saturdays,* 2:30 p.m., *September 26 to November 14.* Dr. Graves.

C6. Fall Flowers and Fruits.—Six outdoor lessons in the Botanic Garden. This is a continuation of Course C8, given in the spring on the flowers and ferns, and takes up in a similar way the study of the native and cultivated fall flowers and fruits. *Fee, $3.00. Tuesdays,* 4 p.m., *September 22 to October 27.*

Dr. Gundersen.

3. *Spring Courses*

C1. Plants in the Home.—How to grow them. Six talks with demonstrations. Practice in potting, mixing soils, making cuttings, etc. This course deals with the principles to be followed in raising plants. The members of the class have the privilege of keeping the plants they have raised. *On account of restricted space in the greenhouse, this class must be limited to 40. Registration according to the order of application. Fee, $3.00. Thursdays,* 4 p.m., *February 18 to March 25.* Mr. Free.

C3. The Flower Garden.—Making the most of it. Five lessons. How to improve soils and get results from planting; old-fashioned flowers; annuals; summer bedding; vines for screening unsightly objects; rose culture; growing of ornamental shrubs; pruning; how to make a lawn and maintain it. *Fee, $2.50.* (Not given in 1926.)

C7. Evolution in the Flowering Plants.—Three illustrated lectures, followed by visits to the conservatories. 1. Comparison of vegetative characters in the higher plants. 2. The structure of flowers: perianth and stamens. 3. The structure of flowers: carpels and ovules. The course is especially recommended to those who are planning to take Course C8, Spring Flowers and Ferns. *Fee, $1.00. Fridays,* 4 p.m., *March 5 to March 19.*

Dr. Gundersen.

C8. Spring Flowers and Ferns.—Eight outdoor lessons in the Botanic Garden on the identification and classification of plants.

The structure of flowers and the characters of plant families are studied. Members should bring a small magnifying glass. *Fee, $4.00. Fridays,* 4 p.m., *April 30 to June 18.* Dr. Gundersen.

C9. Trees and Shrubs of Brooklyn and Vicinity.—Ten outdoor lessons at the Garden and elsewhere in Greater New York, the principal object being to gain a ready acquaintance with the common trees and shrubs of the eastern United States, which are well represented in this region. The species are considered in systematic order, and the features pointed out by which they may be most easily recognized; also their habits, rate of growth, economic value and use, methods of planting and propagation; importance in forestry, horticulture, or landscape art. *Limited to 50 members enrolled in the order of application. Fee, $5.00. Saturdays,* 2:30 p.m., *April 10 to June 12.* Dr. Graves.

D. Consultation and Independent Investigation

1. *Consultation*

Consultation and advice, and the facilities of the laboratories, library, and herbarium are freely at the service of members of the Botanic Garden and others with special problems relating to plants or plant products, especially in the following subjects:

1. **Plant diseases** (phytopathology) and classification of fungi (mycology). Dr. Reed.

2. **Plant breeding** and allied subjects (genetics and experimental evolution). Dr. White.

3. **Plant geography** (phytogeography) **and ecology.** Mr. Taylor.

4. **Classification and identification of flowering plants** (systematic botany). Dr. Gundersen.

5. **The growing of cultivated plants** and their arrangement; also their adaptation to soils, climate, and other factors (horticulture and gardening). Mr. Free.

2. *Investigation* *

For the following research courses, open to those properly qualified for independent investigation, there is a charge covering all

* Courses of graduate rank offered by the Botanic Garden, when approved by the Faculty of the Graduate School of New York University, are listed

expenses, including laboratory fee, of *$30 for each full course* of 100 credit hours, and *$20 for each half course* of 50 credit hours.

E6. Research in Mycology and Plant Pathology.—Independent investigation of problems relating to fungi and fungous diseases of plants. Dr. Reed.

E7. Research in Plant Genetics.—Independent investigation of problems of variation and heredity, including that phase of cytology having a direct bearing on the subject matter of genetics. Dr. White.

E8. Research in Forest Pathology.—Independent investigation of the diseases of woody plants. Dr. Graves.

E9. Research in Systematic Botany of the Flowering Plants. Dr. Gundersen.

IV. OTHER EDUCATIONAL FEATURES

Plantations

The plantations comprise several sections, as follows:

1. General Systematic Section (trees, shrubs, and herbaceous plants not native within 100 miles of Brooklyn).
2. The Local Flora (native wild flower garden).
3. Ecological Garden.
4. Rock Garden.
5. Children's Garden.
6. Japanese Garden, etc.

As noted under *Docentry,* arrangements may be made for viewing the plantations under guidance. They are open free to the public daily from 8 a.m. until dark; on Sundays and holidays from 10 a.m. until dark.

Conservatories

The Garden conservatories contain a collection of tender and tropical plants. Of special interest for teachers of nature study

as courses in the Graduate School, and are given the same credit as other graduate courses. Properly qualified students who take these courses may present them in satisfaction of the requirements for advanced degrees given by the University. Graduate credit has also been allowed elsewhere for such advanced work done at the Garden.

and geography are the following useful plants from the tropics and subtropics: banana, orange, lemon, lime, kumquat, tamarind, West Indian cedar (the source of the wood used for cigar boxes), eucalyptus, Manila hemp, sisal, pandanus (source of the fiber used for making certain kinds of fiber hats), fig, grape vines from north and south Africa, date palm, cocoanut palm, chocolate tree, coffee, tea, ginger, bamboo, mahogany, balsa, cocaine plant, black pepper, cardamom, olive, pomegranate, logwood, durian, mango, sugar cane, avocado (so-called "alligator pear"), West Indian and other rubber plants, banyan, religious fig of India, and numerous others.

The Conservatories are open April 1 to November 1, 10 a.m.–4:30 p.m. (Sundays, 2–4:30); November 1 to April 1, 10 a.m.–4 p.m. (Sundays, 2–4).

Herbarium

The Garden herbarium consists at present of over 186,000 specimens, including phanerogams, ferns, mosses, liverworts, lichens, parasitic and other fungi, algae, and myxomycetes. This collection may be consulted from 9 a.m. until 5 p.m. by those interested, and specimens submitted will be gladly identified.

Library

The rapidly growing library of the Garden comprises at present over 10,400 volumes and over 7,000 pamphlets. This is not a circulating library, but is open free for consultation to all persons daily (except Sundays and holidays) from 9 a.m. until 5 p.m. (Saturdays, 9 to 12). Over 800 periodicals and serial publications devoted to botany and closely related subjects are regularly received.

Laboratory Building

The Laboratory Building contains (besides offices of administration and the Library and Herbarium mentioned above) four laboratory rooms, a culture room, two classrooms with stereopticon and other equipment for instruction, a room for the installation of temporary exhibits, six private research rooms, and an auditorium

seating about 570 and equipped with motion picture machine, stereopticon and lecture table supplied with water, gas, and electric current for experimental lectures.

Instructional Greenhouse

A range of three greenhouses, each about 20 x 30 feet, is provided for the practical instruction of children and adults in plant propagation and other subjects.

Children's Room

A gift of $1,500 in 1921 from the late Mrs. George D. Pratt, supplemented in 1923 by a further gift of $500 from Mr. George D. Pratt, has made it possible to provide a beautifully decorated room for the use of the Boys' and Girls' Club. Any boy or girl who is enrolled, or has been enrolled, in any of the children's classes at the Garden is eligible for membership in this club, which now numbers about 1,000 active members. The room contains shelves for a nature-study library, of which a nucleus has already been secured, and is equipped with stereoscopic views, photographs, and preserved and living specimens of plant life, for the instruction and entertainment of boys and girls. The room is open free to all children. Contributions of specimens and of books on nature study and closely related subjects will be most welcome.

Children's Garden Building

This is located in the northern part of the Children's Garden plot and contains a conference room and rooms for the storage of garden tools and implements. The children's conference room has been refitted this year with furniture appropriate to its uses. The furniture was a gift from Mrs. James H. Post. Various collections of plants, seeds, and insects of economic importance in the garden are accessible here for consultation by the children. North of the Children's Building is a plot planted to ornamental shrubs and herbaceous perennials for the instruction of the children.

Children's Gardens

A plot of about three quarters of an acre in the southeast part of the Botanic Garden has been set aside for the theoretical and practical instruction of children in gardening. The larger part of this area is laid out in garden plots which will accommodate about 150 children. In 1925 there was added to the southern part of this plot a Shakespeare Garden, the gift of Mr. Henry S. Folger.

NOTES

The Italian Young Folks League held a meeting at the Garden on Sunday afternoon, June 21. After a talk on the aims and work of the Garden by the Director, the members of the League inspected the buildings and grounds.

Japanese Garden Party.—On Saturday afternoon, July 18, the League of Neighbors and the Union of East and West held a Japanese garden party at the Botanic Garden. The guests convened in the auditorium at 3:30 o'clock, where addresses were given by Riusaku Tsunoda, secretary of the Japanese Association, on "Japanese love of nature," by Dr. Gager, director of the Botanic Garden, on "The Meaning of a Japanese garden," and by several speakers not announced on the program. Mrs. Alfred Bolton was chairman of the meeting. Japanese adults and children were present in native costume. At the close of the program those attending, to the number of about 400, inspected the Japanese Garden.

Visitors to the Garden from out of town during 1925, not previously noted, include Mr. Hugh Falconer, Department of Parks, Pittsburgh, Pa. (April 27), Miss Bertha Lutz, Museu Nacional, Rio Janeiro, Brazil (June 15), Prof. Bungo Miyazawa, professor of plant breeding, College of Agriculture, Miyazaki, Japan (July 3), Prof. Guy Bisby, professor of plant pathology, Manitoba Agr. Col., Winnipeg (July 15), Mr. John Gray, University of Florida, Gainesville (July 18), Mr. Norman MacDowell, Secretary of Dartmouth College (Aug. 1), Prof. W. Brown, Imperial College

of Science, London, England (Aug. 4), Mr. W. R. Singleton, Bussey Institution, Harvard University (Sept. 8), Prof. Charles J. Chamberlain, University of Chicago (Sept. 18), and Prof. F. O. Bower, Regius Professor of Botany, University of Glasgow (Oct. 6).

The Twelfth Annual Garden Exhibit for Brooklyn Boys and Girls was held in the rotunda of the Laboratory building on Saturday and Sunday, September 26 and 27. The exhibit was open on Friday afternoon, the 25th, for teachers with classes from Brooklyn schools. The judges were Mr. Van Evrie Kilpatrick, Director of Nature Garden Work for New York City, Mr. Arthur Dore, managing editor of the Brooklyn *Citizen,* and Mr. Louis Buhle, acting as alternate for Mrs. William H. Good, who was unavoidably prevented from serving. The bronze tablet trophy, for the best school vegetable display, was won for the third time by Public School 109, and so became the property of the school. The silver cup trophy for the best school flower display was won for the third year by Public School 129, and so became the property of that school. A bronze cup was awarded to Public School 77 for the best display of garden project work in connection with the nature study of the school, and a second prize of four books from the Nature Library to P. S. 89. Eleven school prizes of nature books were awarded to other schools, 16 gold bronze medals as first prizes to individuals, and 19 bronze medals as second prizes were awarded to individuals. Twenty-three potted plants were awarded to children receiving honorable mention. The prizes were presented on October 24.

These annual children's garden exhibits were part of a plan to encourage children's gardening throughout the Borough of Brooklyn, and now that this work seems thoroughly established the need of this encouragement has largely passed, and it has been decided not to hold the exhibits at the Garden after this year.

ERRATA

Page 76, lines 17 and 18, for $75,916.08 read $70,761.00.

INDEX TO VOLUME XIV

Appointments and Resignations, New, 32
Asters, Distribution of, 30
Attendance, Classes and, 62
Attendance, Increase in, 121

Barley and Wheat Smuts, Investigations with, 41
Benedict, Dr. R. C., 44
Boston Fern, 44
Bower, Prof. F. O., 145
Boy Scout Exhibit, 61
Broadcasting, 124
Bulbs, 27, 56
Bunt of Wheat, 41
Burdick, Mrs. Margaret Mann, 32, 50
Burtis, Miss Edna, 68
Butler, Mrs. Glentworth R., 68
Carr, Mr. Henry W., 33

Carson, Mrs. Eva L., 68
Chestnut Bark Disease Investigations, 42
Child Study, Coöperation with National Federation for, 124
Children, Courses for, 131
Children's Garden Building, 143
Children's Gardens, 144
Children's Room, 143
Club Room, Boys and Girls, 67
Conservation, 28
Conservatories, 141
Courses for Teachers of Children's Gardening and Nature Study, 135

Dicotyledons, The Classification of, 45
Director, Report of the, 21
Distribution of Plants, 123
Docentry, 130

Ecology, 44
Education, Contributions to, 23
Endowment, 35
Exhibit, Children's Annual Garden, 68
Exhibits and Teas for Teachers, 124
Faris, Dr. James A., 32, 40, 41
Fence, Botanic Garden, 35, 121
Ferguson, William C., 45
Field Trips, 101
Free, Montague, 58

Gager, Dr. C. Stuart, 38
Garden Exhibit for Brooklyn Boys and Girls, Twelfth Annual, 145
Garden Teachers Association, 68
Genetics, 43
Gifts, 83
Girl Scouts, Tree Planting by, 120
Graves, Dr. Arthur Harmount, 42, 64
Gray, Botanic Garden Wreath for Bust of Asa, 123
Greenhouse, Instructional, 143
Grounds, List of Objects Needed for Beautifying the, 36
Gundersen, Dr. Alfred, 45, 51

Hareubeni, Dr. Ephraim, 125
Herbarium, 29, 50, 142
Herbarium, Report on the Cryptogamic, 58
High Schools, Biology in, 125
Horticulturist and Head Gardener for 1924, Report of the, 54
Inspection, Tenth Annual Spring, 30
Inspection, Eleventh Annual Spring, 119
Instruction for 1924, Report of the Curator of Elementary, 64
Instruction for 1924, Report of the Curator of Public, 60
Instruction, Courses of, 130
Investigations, 26
Investigation, Consultation and Independent, 140
Irises, The Test Garden for Beardless, 115
Italian Young Folks League, 144

Japanese Garden Party, 144
Junior League, 68

Kilpatrick, Van Evrie, 68, 69, 145
Kolk, Miss Laura Alma, 32

Laboratory Building, 142
Lantern Slides, Loan Sets of, 130

Lectures, Public, 60
Librarian for 1924, Report of the, 71
Library, 29, 142
Loan Material, Study and, 129

Meetings of Societies, 100
Members, List of, 104
Membership, 30
Molisch, Dr. Hans, 125
Moore, Major Barrington, 44
Nature Study, Courses in, 135
Needs of the Garden, 34
Neff, Miss Dorothy I., 43
Nephrolpis, 44
Notes, 121, 144

Oat Smuts, The Influence of Environal Factors on, 40

Party, Japanese Garden, 144
Photographic Work, 1924, 101
Plant Breeding, 43
Plant Breeding and Economic Plants for 1924, Report of the Curator, 53
Plant Geography, 44
Plant Pathology, 38
Planting, Miscellaneous, 56
Plants and Plantations for 1924, Report of Curator, 48
Plantations, 141
Post Card Bulletins, 122
Public, Courses for the General, 138
Publications, 1924, 88, 98
Publicity, 63
Putz, Mrs. Frank, 32, 50

Reed, Dr. George M., 38, 40, 58, 118
Report of the Brooklyn Botanic Garden, 1924, Fourteenth Annual, 21
Research for 1924, Reports on, 38
Reynolds, Mr. James J., 68
Rock Garden, 27, 56
Rubber Latex, Paper from, 125

Sanders, Miss Edith, 32
Sargent, Miss Zelda, 69
Schools, Coöperation with, 24, 127
Seed Exchange, International, 28, 49, 57
Seeds, List of, 1
Seeds to School Children, Penny Packets of, 124, 129
Seed Work, 68
Shaw, Miss Ellen Eddy, 71
Simpson, Miss Ray, 76
Smut Resistance, Inheritance of, 40
Sorghum Smuts, Investigations with, 40
Staff Conferences, 122
Statement for 1924, Financial, 76
Statistics, 26
Stoll, Mr. Frank, 102
Study Material, 61
Systematic Botany, 45

Talks, Public Lectures, Etc., 92
Taylor, Mr. Norman, 44, 48
Teachers, Courses for, 134
Teachers, Exhibits and Teas for, 124
Teachers of Children's Gardening and Nature Study, Courses for, 135
Teas and Exhibits for Teachers, 124
Trustees, Officers of the Board of, 102
Turner, Miss Mabel E., 32

Utter, Mr. Gordon, 68

Visitors, 125, 144
Visiting Classes, 64
Voris, Miss M. E., 33

Weber, Mrs. William O., 32
Wheat Smuts, Investigations with, 41
White, Dr. Orland E., 43, 54
Woman's Auxiliary, 103
Woodward, Miss Ethel V., 33

Young, Mrs. LeRoy, 68

The Brooklyn Institute of Arts and Sciences

OFFICERS OF THE BOARD
OF TRUSTEES

PRESIDENT
FRANK L. BABBOTT

FIRST VICE-PRESIDENT
WALTER L. CRITTENDEN

SECOND VICE-PRESIDENT
EDWARD C. BLUM

THIRD VICE-PRESIDENT
WILLIAM A. PUTNAM

TREASURER
G. FOSTER SMITH

SECRETARY
JOHN H. DENBIGH

BOTANIC GARDEN GOVERNING COMMITTEE

FRANK BAILEY, *Chairman*

FRANK L. BABBOTT, *Ex officio*
MRS. WILLIAM H. CARY
WALTER H. CRITTENDEN
GATES D. FAHNESTOCK
MRS. LEWIS W. FRANCIS
JOHN W. FROTHINGHAM
MISS HILDA LOINES
EDWIN P. MAYNARD
WILLIAM A. PUTNAM
ALEXANDER M. WHITE

EX OFFICIO MEMBERS OF THE BOARD

THE MAYOR OF THE CITY OF NEW YORK
THE PRESIDENT OF THE BOROUGH OF BROOKLYN
THE COMMISSIONER OF PARKS, BOROUGH OF BROOKLYN

GENERAL INFORMATION

MEMBERSHIP.—All persons who are interested in the objects and maintenance of the Brooklyn Botanic Garden are eligible to membership. Members enjoy special privileges. Annual Membership, $10 yearly; Sustaining Membership, $25 yearly; Life Membership, $500. Full information concerning membership may be had by addressing *The Director, Brooklyn Botanic Garden, Brooklyn, N. Y.* Telephone, 6173 Prospect.

THE BOTANIC GARDEN is open free to the public daily from 8 a.m. until dark; on Sundays and Holidays open at 10 a.m.

ENTRANCES.—On Flatbush Avenue, near Empire Boulevard (Malbone Street), and near Mt. Prospect Reservoir; on Washington Avenue, south of Eastern Parkway and near Empire Boulevard; on Eastern Parkway, west of the Museum Building.

The street entrance to the Laboratory Building is at 1000 Washington Avenue, opposite Montgomery Street.

TO ASSIST MEMBERS and others in studying the collections the services of a docent may be obtained. This service is free of charge to *members of the Botanic Garden;* to others there is a charge of 50 cents per person. Arrangements must be made by application to the Curator of Public Instruction at least one week in advance. No parties of less than six adults will be conducted.

TO REACH THE GARDEN take Broadway (B.M.T.) Subway to Prospect Park station; Interborough Subway to Eastern Parkway-Brooklyn Museum Station; Flatbush Avenue trolley to Empire Boulevard; Franklin Avenue, Lorimer Street, and Tompkins Avenue trolleys to Washington Avenue; St John's Place trolley to Sterling Place and Washington Avenue; Union Street and Vanderbilt Avenue trolleys to Prospect Park Plaza and Union Street.

PUBLICATIONS
OF THE
BROOKLYN BOTANIC GARDEN

RECORD. Established, January, 1912. An administrative periodical issued quarterly. Contains, among other things, the *Annual Report* of the director and heads of departments, special reports, announcements of courses of instruction, seed list, miscellaneous papers, and notes concerning Garden progress and events. Free to members of the Garden. To others one dollar a year; 25 cents a copy.

MEMOIRS. Established, July, 1918. Published irregularly.

Volume I, *Dedication Papers:* comprising scientific papers presented at the dedication of the laboratory building and plant houses, April 19–21, 1917. Price $3.50, plus postage.

Volume II. The vegetation of Long Island. Part I, The vegetation of Montauk: A study of grassland and forest. Price $1.00, plus postage.

CONTRIBUTIONS. Established, April 1, 1911. Papers originally published in periodicals, reissued as "separates," without change of paging, and numbered consecutively. This series includes occasional papers, as well as those embodying the results of research done at the Garden, or by members of its staff or students. Twenty-five numbers constitute one volume. Price 25 cents each, $5.00 a volume.

36. Influence of environmental factors on the infection of sorghums and oats by smuts. I. Experiments with covered and loose kernel smuts of sorghum. 17 pages, 7 figures. 1924.

37. Influence of environal factors on the infection of sorghums and oats by smuts. II. Experiments with covered smut of oats and general considerations. 21 pages, 3 plates. 1924.

38. Physiologic races of oat smuts. 10 pages, 3 plates. 1924.

39. Relative susceptibility of selections from a Fulghum-Swedish select cross to the smuts of oats. 17 pages, 4 plates. 1925.

40. Physiological specialization of Ustilago hordei. 21 pages, 1 figure. 1924.

41. Factors influencing the infection of wheat by Tilletia Tritici and Tilletia laevis. 24 pages, 4 plates. 1924.

42. Variation among the sporelings of a fertile sport of the Boston fern. 27 pages, 15 figures. 1924.

44. Modes of infection of sorghums by loose kernel smut. 17 pages, 3 plates. 1925.

LEAFLETS. Established, April 10, 1913. Published weekly or biweekly during April, May, June, September, and October. The purpose of the *Leaflets* is primarily to give announcements concerning flowering and other plant activities to be seen in the Garden near the date of issue, and to give popular, elementary information about plant life for teachers and others. Free to members of the Garden. To others, fifty cents a series. Single numbers 5 cents each.

GUIDES to the collections, buildings, and grounds. Price based upon cost of publication.

SEED LIST. Established, December, 1914. Since 1925 issued each year in the January number of the RECORD.

AMERICAN JOURNAL OF BOTANY. Established, January, 1914. Published, in coöperation with the BOTANICAL SOCIETY OF AMERICA, monthly, except during August and September. Subscription, $6.00 a year.

ECOLOGY. Established, January, 1920. Published quarterly in coöperation with the ECOLOGICAL SOCIETY OF AMERICA. Subscription, $4.00 a year.

GENETICS. Established, January, 1916. Bi-monthly. Subscription, $6.00 a year.